

COMMUNICATION ARTS BOOKS



how to use a tape recorder

in your business ... in your home

DICK HODGSON
and
H. JAY BULLEN

HOW TO USE A TAPE RECORDER

. . . in your business

. . . in your home

by **Dick Hodgson**

Executive Editor, *Advertising Requirements
and Industrial Marketing*

and **H. Jay Bullen**

Managing Director, *BulMarc Features*

How to Use a Tape Recorder aims to help business and home recorder owners learn how to get full value from their machines. It is written strictly for the recorder owner, or user, who doesn't know a cathode-follower from a phono jack (and cares less). While the book explains in layman's language the basic workings of a tape recorder and its accessories, its primary purpose is to show how to get maximum use from this versatile modern-day tool of communication.

For the businessman, there are hundreds of potential uses explained in detail—everything from using a recorder for training new salesmen to cutting costs on inventory taking and adding a voice to point-of-purchase advertising displays. For those who have a recorder in their homes, or who can bring it home from the office, there are dozens of party games explained here. Outlined, too, are many uses of the recorder for hobbies, special events, child training and smoother home operation.

For those who have yet to buy a recorder, this book explains what to look for in selecting a machine. There are simple charts showing every aspect of the "ideal" recorder, and complete information on all types of accessories. Finally, there is a frank, helpful discussion on the "care and feeding" of recorders, including what to look for in servicing or repairs.

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HOW TO USE A TAPE RECORDER

HOW TO USE A

in your business

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TAPE RECORDER

in your home

by Dick Hodgson

and

H. Jay Bullen

HASTINGS HOUSE, PUBLISHERS, NEW YORK

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For Lois and Grace

. . . who had to listen to endless discussions on tape recording contained in many miles of recorded tape . . . and put up with the seemingly ceaseless pounding of typewriter keys for over three years.

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FOREWORD

Much of the credit for this book must go, not to any individual or organization, but to an amazing instrument—the tape recorder. Without this electronic marvel, there would not only have been no subject, but in all probability the co-authors would never have been able to collaborate on any project.

When the idea for such a book first entered my mind, I immediately recognized that while the tape recorder was an old and familiar friend, I was not enough of a technician to adequately cover much of the information which was required. The answer was obvious—collaborate with someone who could provide the technical know-how. The right person for the job was also obvious—a close friend from Marine Corps days, H. Jay Bullen.

But I was busy editing a new magazine in Chicago, and Jay Bullen was busy at work as general manager of *Leatherneck Magazine* in Washington. We had, however, been keeping in regular contact via tape recordings . . . and thus the idea for the book developed through the medium it was to cover. Later, Jay moved to California and again tape recorded correspondence provided an efficient link, simplifying the job of developing ideas, making comments on various material and editing.

But to credit just the tape recorder, itself, would be to fail to do justice to many industry experts who helped to provide much of the material you will find in these pages. Officials of most of the companies manufacturing tape recorders were especially helpful in providing many technical details. Manufacturers of tape and accessories were also of special assistance. Minnesota Mining and Manufacturing Company, in particular, helped on much special research.

PART ONE

- 1. WHY A TAPE RECORDER**
- 2. TAPE RECORDER DEVELOPMENT: A HISTORY**
- 3. AUTOMATION IN BUSINESS COMMUNICATIONS**
- 4. TECHNIQUES OF USING A TAPE RECORDER**



CHAPTER 1

WHY A TAPE RECORDER

BUSINESS PROCEDURES were revolutionized a comparatively few years ago by a device called the telephone. A new revolution is currently underway. The device responsible is called the magnetic tape recorder.

What the automobile was to the horse and buggy, the tape recorder is to older methods of sound recording. The automobile left a solid and permanent impact on all types of business, its methods and techniques. The tape recorder promises to do the same.

A magnetic tape recorder was an inevitability because of the American penchant for finding simpler, more efficient ways to do a job. For years technicians had a workable recorder *almost* within their grasp—except for one, all-important element. Hitler's sound technicians unwillingly supplied the missing element late in World War II. At this point American ingenuity climbed back into the driver's seat and transformed what had previously been a delicate, expensive laboratory instrument into an amazingly practical and dependable tool of a thousand uses, reasonably priced.

Today's magnetic tape recorder represents a new technique for accomplishing many essential business operations presently

being done by slower, more expensive, less desirable methods. Audible sound has been given a new dimension—not just in quality of reproduction, but in *use for purpose* as well. The desire to use sound for various purposes is not new, but until the advent of the tape recorder it was frequently impossible or impractical due to various operational and mechanical complexities. Tape recorders have changed all this and converted sound into a new tool for the modern businessman.

Six basic factors are responsible for the magnetic tape recorder's superiority over previously-used methods for recording sound:

- Fidelity of recorded and reproduced sound
- Simplicity of recorder operation
- Flexibility
- Versatility
- Economy of operation
- Convenience

Fidelity of Sound Generally speaking, a tape recorder is subject to fewer pitfalls for faithful sound reproduction than either disc or wire recorders. A tape doesn't have grooves which wear out a little more with each playing and it doesn't have the response-limiting thickness that wire must have to make it manageable in handling.

A good disc can produce sound of excellent quality—the first time a stylus rides through the grooves. This quality deteriorates with every playing because the stylus physically wears away more and more of the material from which the disc is made. The disc soon becomes “scratchy” and full of extraneous noises. To date no one has been able to deteriorate the original sound quality of a tape by repeated playing.

A wire recording doesn't have the same problems as a disc recording. It has its own special brand. To get even a passably wide range of frequencies on a wire it must be driven at a comparatively high speed. Even then it can't hold its own with a magnetic tape. Wire is too thin to handle easily and too thick to record high frequencies.

**Simplicity of
Recorder Operation**

If you can tune in a picture on a television set you can operate a tape recorder—the first time you try it! In fact, you'll probably have less trouble getting satisfactory results than you did the first time you tried to make the picture stand still and stay in the middle of your TV tube. The same can't be said about either wire or disc recording.

With disc recorders you need more equipment, more time and more technical proficiency to get comparable results. Seldom will you find even the most expert technician making a recording of himself. There are too many mechanical operations to perform *during* the recording. With tape, you turn on the recorder, pick up the microphone, and you're ready—either to record yourself or someone else. If you make a mistake on a disc recording you put on a new disc, throw away the old, and start from scratch. With tape you merely go back to the beginning of the unwanted section and record right over the mistake. No waste; no lost time; and no added expense.

Operating a wire recorder is much simpler than disc recording, but still more difficult than tape. If the wire gets kinked or tangled you've got troubles coming up—breakage, distorted sound, etc.

Flexibility A high quality tape recording can be made in an expensive sound studio—or in the front seat of your car!

If you've ever seen the assorted paraphernalia needed to make a disc recording you know immediately why no one tries to use the same unit to make high quality recordings in an office, on a train, in a hotel room or in a booth at a sales convention and display.

Good disc recorders are cumbersome and expensive. Portable disc recorders of like quality may be even more expensive than studio equipment, and they can't stand much abuse. Studio-quality *portable* tape recorders deliver the same performance in the studio or in the field; they can stand considerable physical abuse and you don't have to dip into capital reserves to buy one.

Versatility On today's market there are tape recorders which will record a new program while simultaneously playing back one that was previously recorded! And you can choose your own method of playback—either for your ears alone, or for an audience of up to three or four hundred people.

If you need a public address system for special occasions, and you bought the right model, you can use your tape recorder. Depending on your desires, you can use the unit as a straight P.A. system or you can make it do double duty and simultaneously record the sounds the audience hears coming out of your speaker.

Economy of Operation You can record (or play back) a magnetic tape one time or one thousand times. One tape manufacturer has laboratory-tested one reel of tape by re-recording it over 6,000 times—and he's still at it. No one has yet been able to perform similar magic with a disc. And wire recorders don't make out too well in this type of "recordathon" either. The problem is not one of trying to get long-gone sounds out of worn-out grooves, but rather of keeping the wire from kinking and snapping.

Convenience It is possible to get nearly 13 *hours* of sound on one seven-inch reel of tape! It would take at least 12 separate LP-type discs to accommodate a recording of the same length. If you wanted to mail a recording of this length you would have the choice of mailing either one tape or 12 or more discs.

If you want to make a considerable number of duplicates of the original, you use the tape as its own master. With a disc you need a special master. This means more time, more money, more bother.

After a tape recording has served its purpose it can be erased and re-recorded. Discs don't lend themselves to this type of treatment.

By Way of Explanation The purpose of this book is not to convince the reader that a magnetic tape recorder is the panacea for *all* business problems

involving sound. Instead, it is to present tape recorders as what they actually are today—a *single* device which can more than adequately do a *variety* of jobs now being done by a number of individual, different machines and methods.

There are dictating machines that are better for dictation than a tape recorder. But the dictating machine can't record narration for slides or motion pictures. There are Stenotype machines which can take down every last "aaah," "er," and statistic given in a convention speech (if the operator is thoroughly competent and wide awake). But the Stenotype machine can't be rewound for an immediate playback of something that is intelligible to anyone but the stenotypist. Public address units can turn out a higher volume of sound than most tape recorders used for the same purpose. But P.A. units can't be used to record inter-office memos or salesmen's call reports.

A tape recorder can do all this—and more—simply, rapidly, efficiently and economically.

CHAPTER 2

TAPE RECORDER DEVELOPMENT: A HISTORY

THE DEVELOPMENT of the tape recorder represents a story of amazing progress in a very short period of time. From the end of World War II—when the first important development work began on tape recorders in America—until 1950, the versatile electronic tool progressed from a “dream” to a well-established industry.

Although the tape recorder came of age in this five-year period, it is by no means a youngster. The first magnetic recorder won the grand prize at the Paris Exposition of 1900 for a Danish engineer named Vladimir Poulsen. Known at that time as the “Telegraphone,” it was the sensation of its day. It even gained a degree of popularity in the U. S., with duPont, for one, ordering 20 Telegraphones for its Wilmington office.

These early magnetic recorders, however, left much to be desired. The perfection of the vacuum tube stimulated development and the Naval Research Laboratory and others worked on the principle all through the 1920's.

The first big step came during World War II when wire recorders were developed by the Armour Research Institute and Brush Development Co. for American armed forces. Previously, wire recorders had fascinated people in the 1930's when used

for such recordings as King George V's New Year's Day greetings in 1930 over BBC and at the 1939 New York World's Fair where they were used to record voices of visitors talking on the telephone. In many cases, the early applications used a steel tape.

But the story of how *tape* recorders first got their start in America has its foundation as part of the history of World War II.

U. S. Army intelligence officers, monitoring Nazi broadcasts in England before the Normandy invasion, became curious about the timing of some of Hitler's broadcasts. Der Fuehrer's voice came on the air just too frequently for a man so busy directing a nation at war. Obviously, it seemed, the speeches were recordings—but not the usual kind—there was none of the scratch, rumble or background noise, which Americans were accustomed to hearing on records.

American sound engineers had known of a phenomenal German instrument called the "Magnetophon" which produced high fidelity recordings on a magnetic plastic tape. But the last available reports indicated that even this device wasn't capable of producing the high quality of Hitler's broadcasts.

Putting two and two together, however, the sound engineers monitoring the Nazi broadcasts came to the conclusion that the broadcasts indicated that the Germans had made some amazing developments in tape recordings. Thus, one of the tasks of Allied expeditionary forces became the "capture" of one of the improved tape recorders.

But the task was not to be an easy one. The Nazis had no intentions of giving up their highly developed radio secrets. Although special Commandos were assigned to capture German stations before they could be destroyed, the Nazis always seemed to be one step ahead of them. One by one they blew up every single radio installation from Normandy to Paris just before the Commandos arrived—and, unfortunately, just as the Allied forces arrived in several cases.

The Allied forces, however, rolled up a momentum that was too much for the Nazis and Signal Corps officers soon had the

prize they sought—the improved versions of the Magnetophon tape recorder. From a handful of “liberated” Magnetophons has sprung the whole tape recorder industry in America, which is now represented by millions of sets.

Much of the development story can be traced to a former telephone engineer who was a member of one of the Signal Corps teams which was assigned the task of examining captured German sound equipment. Several German tape recorders were uncovered, but it wasn't until the Americans captured Radio Frankfurt that John T. Mullin really had his eyes opened. At Radio Frankfurt was found a Magnetophon that was superior to anything that had ever been seen before in the field of sound reproduction. The frequency response went to 10,000 cycles per second and the recordings were “clean.”

Because of his previous experience as a telephone engineer, Mullin recognized the potential of the improved Magnetophon immediately. He dug into maintenance manuals for the recorder and photographed every page of the instruction book. As he checked into the possibilities, he found that a few simple changes could extend the frequency response even further.

The improved recorder was immediately put into daily use once the American forces began broadcasting from Frankfurt. However, Mullin figured out how other Magnetophons could be rebuilt to provide the same fidelity as the latest broadcast model. To prove his point, Mullin and another Signal Corps man rebuilt a “standard” Magnetophon and found that it lived up to its promise.

Meanwhile, several technical teams had been rounding up German sound equipment and soon the Signal Corps headquarters in Paris was overflowing with German recorders. With an eye to the future, Mullin obtained two of the “surplus” Magnetophons and shipped them piece by piece back to his home in San Francisco. When Mullin arrived in San Francisco in 1945, one of the first things he did was assemble the two Magnetophon recorders.

Then, instead of going back to his old job with the telephone

company, Mullin joined an old friend, Bill Palmer of Palmer Films in San Francisco, and put the recorders to work making sound tracks for motion pictures early in 1946.

Before long, Mullin and Palmer joined Ampex Electric Co., a war-born company which had been turning out electric motors but was looking for an entree into the high fidelity field. Their mission was to assist in building an American tape recorder patterned after the Magnetophon.

Ampex wasn't, by any matter of means, the only firm working on an American tape recorder. Others included Marvin Camras of the Armour Research Foundation, who has accumulated many patents in the magnetic recording field; S. J. Begun of Brush Development Co., and Colonel Richard N. Ranger of the Signal Corps, who, like Mullin, brought back a German Magnetophon from Europe and set to work to produce an American version.

But another of Jack Mullin's "lucky" connections was to become the link in that five-year chain that brought the tape recorder from a dream to a major industry in America. The connection was with Bing Crosby, and it resulted in a major step forward for tape recording.

Crosby Enterprises sent a man up to San Francisco to Palmer Films for some work on an industrial film. There he saw the amazing Magnetophon and the work Mullin and Palmer were doing with it. "That," said the Crosby man, "is just what Bing is looking for!"

"Der Bingle" was attempting to produce his Philco radio shows on discs rather than doing them live. This meant trying to edit many short recordings into a single half-hour disc for each show—and involved dubbing from disc to disc and then frequently re-dubbing before the show was ready to be aired. During the season, 39 such editing jobs had to be done. Technical problems were so great that it looked for a time as if Crosby would have to give up the recording idea and go back to doing his shows live.

In June, 1947, Mullin and Palmer demonstrated their tape recorders for Crosby's producers. By August the deal was set—the Crosby shows were to be tape recorded on Mullin's Mag-

netophones. A few months later Bing Crosby Enterprises bought the first Ampex machines. The first Ampex-recorded Crosby show brought about the next major step toward tape recorder acceptance—American Broadcasting Co. bought 24 Model 200 Ampexes (at \$5200 each). Capitol Records then bought two of the units—and the dam had burst!

By 1950, tape recorders became the *standard* form of professional recording. Many others outside the Mullin-Palmer-Ampex-Crosby-ABC chain of events played major roles in the rapid development of magnetic recording, but there is little doubt that Mullin's German Magnetophones provided the vital spark.

Side-by-side with recorder acceptance was the development of improved recording tapes. Particularly important in this chapter of the history of magnetic recording was the experimental work of Minnesota Mining & Manufacturing Company. Without the special recording tapes produced by 3M, it is unlikely that tape recording would have moved nearly as fast as it did. Each time a major improvement was made in recorders, a tape improvement paralleled it . . . with 3M taking the lead. Also playing a major role in tape development was Marvin Camras of Armour Research.

The period from 1950 to 1952 was the era of major development of tape recorders. With the medium well established, there was time to simplify machines . . . design them for broader markets . . . develop recorders in all price ranges. In this period tape recording progressed from being only a professional recording medium with non-professionals considering it an "interesting gimmick" into the standard recording medium for professional, educational, business and home uses.

At this writing, tape recorders are still in a development stage, with new improvements being announced almost every week. Industry experts are making all kinds of predictions as to the eventual status of the industry. The best guesses place the industry annual income in the next decade at over \$200 million, with from three to five million tape recorders in use.

There is little doubt that there will be further major improvements in tape recorders. The future indicates better and

more simply operated sets at lower costs . . . and at least one revolutionary development close at hand—picture recording. The technicians assure us that it won't be long before *both* pictures and sound can be easily recorded on tape, bringing about a major change in the television and motion picture industries and transforming the old home phonograph into a special kind of TV set which will show "programs" of the viewer's own choice—whenever he wants to see them—and without commercials.

CHAPTER 3

AUTOMATION IN BUSINESS COMMUNICATIONS

WE DON'T need a history book of the next century to tell us that we have entered another cycle in the great "Industrial Revolution." This is, without a doubt, *The Age of Automation*.

Wherever you turn, new tools are bringing a high state of efficiency to every phase of American industry. Keeping pace with this new industrial look has been an important development in the field of business communications—the magnetic tape recorder.

While it was first developed in America as a means of producing radio programs, and then was "picked up" by schools and churches as an educational tool, the tape recorder soon found its way into business circles and within a couple of years had achieved a status seldom accorded a new tool.

Today the tape recorder is widely accepted as an important instrument for business communication and in many of its applications it has brought to this field the automation that is the spark of business development today. While it's true that the tape recorder has only replaced other similar tools in some of its uses, its versatility has permitted it to be accepted in roles where no form of sound recorder has previously been permitted.

The amazing versatility of the tape recorder in business and industry—and even the home—is the theme of this book. The subsequent chapters outline some of the thousands of uses to which tape recording has been applied. It would be impossible, however, to catalog all of them. Clear evidence of this fact is the number of revisions required for each chapter. Even before any of the chapters had been completed, new uses were already being reported in the fields covered.

Because of the rapidly multiplying uses, perhaps it would be well to outline some of the general categories of business and industrial application as a general guide to the usefulness of the tape recorder.

Sound Records The first and major use of the tape recorder in business we have chosen to call “sound records.” This application involves records of all types, whether temporary, semi-permanent or permanent. That one instrument can be used for any or all of these requirements is a clue to the reason for its rapid acceptance.

Typical of the sound records which can be handled by a tape recorder are office-to-field and field-to-office communications, reports, dictation, inventory records, delivery control, order-taking, presentations, analytical reviews, etc.

Tapes can be used and reused as often as necessary—or stored for temporary or permanent records. They provide unerring accuracy, ease of storage, economy and simplicity.

Sales In the sales department, the tape recorder is being used to record sales conferences, for sales training, for preparing tailored sales presentations and for market research. It can be used for dealer and consumer interviews, as a sales tool and for preparing end-use reports.

Advertising In advertising, the “idea men” have long since discovered that the tape recorder is a highly versatile tool. It is used to record idea sessions, for checking radio programs, for research, to repeat advertising messages in stores and in exhibits, for news releases to radio stations, for

presenting campaign ideas, to try out radio and television commercials.

It's also useful for obtaining data of a technical nature for reference by copywriters, as sound to go with TV or film storyboards, to get on-the-spot testimonials . . . and in scores of other ways.

Training As a business training tool, the tape recorder is able to do many jobs which were impossible before. Some companies have built libraries of successful sales talks . . . used the recorder to "transcribe" sales meetings for the benefit of those who couldn't be present or for future reference . . . for self-evaluation . . . orientation of new employees . . . etc.

Audio and Visual Programs The tape recorder is a natural implement in any audio and visual program. It can provide sound for slide films or can be used for motion picture narration. In other cases, tape recordings alone can play a vital role in companies' audio and visual programs.

Add to these major categories such items as using a tape recorder for mood music in a factory . . . dictation . . . laboratory research . . . time and motion studies . . . for safety warnings . . . idea exchange . . . company news programs . . . and hundreds of other potential applications described in the following chapters. The net result is clear cut evidence that the tape recorder can no longer be cast aside as a toy, a delightful hobby or a complicated instrument of use primarily in radio stations or sound laboratories.

This is not a book of theory, or a collection of dreams. It is the record of how forward-thinking businessmen have taken a modern electronic marvel and, in a few short years, developed it into an indispensable business tool.

CHAPTER 4

TECHNIQUES OF USING A TAPE RECORDER

THOUGHTS ARE the fundamental basis of any sounds coming out of a tape recorder. This is true whether the sounds are bird calls, singing commercials or an annual stockholder's meeting. The thoughts can be organized or disorganized and the recorded tape will reflect them with unflinching accuracy and unemotional candor.

Photographers are fond of pointing out that most people see "selectively"; i.e., in any scene they pick out only the elements they want to see. A camera lens doesn't do this. It sees everything in front of it, frequently to the embarrassment of the amateur who didn't notice the "No Dogs in the Park" sign protruding from the left ear of his pet Chihuahua.

The human ear is the same as the eye. It usually hears only what it wants to hear. The tape recorder is a blood brother to the camera lens: it reproduces everything the microphone will pick up—with no discrimination except that of an electronic nature.

The significant point in both cases is that, marvelous as a camera lens or a tape recorder is, neither one possesses the one capability which makes man a superior being—the power to

think. Thinking about what a tape recorder's capabilities are and what it will do, *before and during* the making of a recording, is the main factor that makes the difference between a recording of value and one that is just so many sounds stored on tape.

Most people who use a tape recorder for the first time stop thinking the instant they have the switch in the "record" position. This is probably due to the fact that a recorder is so simple to operate and they *know* that "*everything* will be on the tape." (The "No Dogs Allowed" sign was in the picture, too, but it wasn't wanted.)

The same people who stop thinking when they start recording, *start* thinking when they begin to play it back. It's too late. The damage has been done. At this point it takes much more thought to get logic out of the recording than it would have taken to put it into the recording in the first place. It can still be done, but it takes more time and effort.

This is the point at which many people are inclined to write off the tape recorder as "impractical and too unwieldy to use" and return to their previous techniques of preparing reports, outlining sales or promotional campaigns, training personnel or storing business data.

Remember the first few letters you dictated to a secretary or to a dictating machine? In all honesty, could you claim they were as good as the ones you'd previously prepared on a typewriter or in longhand? Still, you didn't fire the secretary, throw away the machine and go back to preparing letters by hand. (If you did, you may as well skip the rest of this chapter, because it's not for you.)

The clue to proficient dictation was learning the techniques involved in using a new method to do an old job. You realized this after the first few attempts so you made a conscientious—and successful—effort to master the thought processes involved.

The identical problem exists with tape recorders. They're a new kind of tool. It takes a new philosophy—type of thought pattern—to get *on* your tapes the thought stimuli you want to come *off* of them during playback.

In Chapter 9 we discuss the use of a tape recorder as a "Memory Master." This particular technique is possibly the most dramatic single example to illustrate the fact that effective use of the tape recorder necessitates a new method (or philosophy) of "thinking" instead of relying on the method you're accustomed to using when making written notes or records.

Beginning about the time that Eve offered Adam his first piece of fruit, man has been resorting to written (or scribbled) symbols to convey his thoughts to others, or to make permanent or temporary records of eventful happenings. When you consider the number of centuries, decades, years, months and days between then and now—during all of which time we have been *writing* our thoughts on rock, papyrus, scrolls and paper—it's pretty obvious that a "habit" has become somewhat indelibly ingrained in the mental and physical behavior patterns of all mortals.

It only takes six or seven years to establish basic and permanent habit patterns—according to child psychologists and professional educators. The human race has been working on the writing habit for several thousand years. Understandably we've got a problem on our hands when we endeavor, *not* to break *entirely*, but to *modify slightly* a habit that old. It can be done but it is definitely not an easy assignment. However, verified case histories of pioneer, iconoclastic tape recorder enthusiasts prove that the rewards are high. The rewards are in the form of time, effort and money saved, as well as increased efficiency, productivity and quality of output. They're worth working for.

As in most other phases of human endeavor, persistence, tenacity and a predetermined plan of attack are the clues to ultimate success. It's trite, but true—practice makes perfect. And the correct theory of tape recorder utilization is definitely not an exception to the established rule.

The basic techniques of tape recorder usage are simple and there are only three of them:

- Organization of thoughts *before* starting a recording
- Continuation of the thinking process *during the recording*
- Selective listening during playback

Organizing Your Thoughts When you first started composing business letters, years ago, you possibly made a written content outline before you wrote the actual letter. Except in unusual cases you probably don't do that today. You still use an outline though—a mental one; you decide what points you're going to cover in the letter and then you start dictating.

This same technique should be applied to your tape recordings. At first you may have to resort to a written outline. After a while it won't be necessary. Organizing your thoughts prior to recording—instead of ad libbing from one random "thought" to the next—will make the finished tape much more effective from an impact standpoint. The "message" will come through, to any listener, with much more clarity.

Incidentally, this doesn't mean that you ought to write a formal script for a report, an inter-office memo or a sales conference. Just jot down the points to be covered then present each one in a conversational manner.

Thinking During the Recording Depending on their individual personalities, people tend to do one of two things when they've got a microphone in their hand: introverts freeze up from "mike fright" and extroverts go Shakespearean and indulge in all sort of nonsensical verbalities.

In both cases there's one common factor—they're not thinking *during* the recording.

It's true, the recorder will take down every word you utter and you can always separate the pearls from the oysters when you listen to the playback. But there are likely to be many more oysters than pearls and you'll waste a lot of time looking for jewels. This is another point where beginners tend to discredit recorders, the idea being, "I wouldn't have to wade through all this extraneous stuff if the thing were on paper." True, but other things that *should* be on paper wouldn't be—just because of the time and trouble involved in writing them.

If you'll keep on thinking during a recording, just as you do in normal conversation, you'll end up with even more "meat"

than you had in the pre-recording outline. Ideas beget ideas. There's nothing to stop you from interpolating or adding to the basic outline you had. And you can do it easily if you consciously think of what you or your companions are talking about during the recording.

Selective Listening During Playback Regardless of how well you or your associates organized your thoughts before recording, or how intently you kept your thoughts buzzing during the recording, there will be sections which are not of great consequence in the final analysis. This is as it should be. In the process of making a recording—a customer interview or a testimonial, for instance—you suddenly get a new slant on your original concept.

During the playback, listen only for facts that are significant to the project at hand. Make notes as you listen. If you know what you're listening for before you start the playback, you'll retain the important concepts without having to play the tape over and over again.

Practical Tips about Recording and Playback Techniques The first time you want to record someone other than yourself you'll realize that some complicating factors have been added. We don't mean technical problems; we're referring to the human variety. You've gotten yourself into an "interview-type" situation.

In most cases, particularly if it's the first time for the interviewee(s), there may be a problem of mike fright. You'll have to accept the chore of keeping things moving. (That is where the pre-recording organization comes in.) Make the microphone as inconspicuous as possible and try not to make an issue out of turning on the recorder. If necessary, put the mike in some appropriate spot, start a casual conversation and then turn on the recorder sometime later—as inconspicuously as possible.

This is analogous to the technique some photographers use in shooting pictures of inexperienced models. They start clicking the shutter with no film in the camera and suddenly

switch to using loaded film holders without any fanfare. The advantage is obvious: any tenseness or fright has been overcome by the time you get around to the assignment at hand.

Whether you record the "warm-up" or not depends entirely on the situation and the people involved. The advantage of tape is, if you did record it, it's there to hear if you want it on playback, or you can just skip over that part and start in with the beginning of the actual interview.

This brings up a point about listening to playbacks. Beginners confronted with a 20 minute or half-hour long tape frequently complain that it's impossible for them to remember everything they hear, even after two or three playbacks. They say they either have to play the tape over and over or else transcribe it to paper. So, they ask, why not write it in the first place and save time?

The answer is this: except in the case of professional writers the written word is seldom as powerful—or comprehensive—as conversation, which contains colorful phraseology, unconscious humor, spontaneity and the added impact of thoughts conveyed by voice inflections.

The solution to the problem is twofold: selective listening *and* selective notations.

Tape can be edited—pieces cut out and the remaining sections spliced together. There are people who make their living doing this for radio and television stations. Every day they face the problem of listening to long tapes they've never heard before and having to remember certain sections. From a half-hour tape they may only want two-and-a-half minutes for a particular show—but it has to be the right two-and-a-half minutes. They've devised a system that works beautifully, and it solves the problem for the businessman with the short memory.

The first time they listen to a tape they make rough one-word or one-sentence notes of the general content *and they note either the elapsed time or the footage at the beginnings of each section*. When they finish a tape they have an outline of the total content. They couldn't recite it word for word,

but a quick glance at the outline is sufficient for them to tell you who said what, to whom, and how.

Magazine writers have found this technique quite effective for reviewing "tape notes" acquired during interviews. In the past they either took notes (sometimes distracting the interviewee) or tried to remember all the important facts. Neither technique was infallible. With recorders, they "tape" everything and then outline the content of individual tapes so that when they want a particular section for a direct quote or a general comment, they can find the tape and the particular spot on the tape, immediately.

This, then, is an answer to the individual who feels that a tape is "more bother than it's worth because you have to make a verbatim typewritten transcription anyhow."

To repeat, the process is actually quite simple: first, think *before* you push the "record" button; second, keep thinking *during* the entire period that sounds are being put on the tape; and, third, think some more *after* the recording is completed and you're listening to the playback.

Incidentally, here's a point to keep in mind during a recording, particularly the so-called "interview" type: it is *not* imperative—or even desirable—that every single inch of recorded tape contain "sound."

Recall some of the movies or stage plays you've seen or some of the programs you've heard on radio. Professional actors often *intentionally* use momentary pauses in the flow of dialogue or other sounds. They do it for emphasis or dramatic effect—and, because it's the natural thing to do.

It's the same with you. When you're speaking to someone, you don't talk in a completely uninterrupted, steady stream—unless you're a circus or carnival barker. You pause momentarily while you think of what you're going to say next or while you absorb the full meaning of the reply made to a previous statement. Feel free to do the same thing on tape. A few seconds of "dead air" every so often won't hurt a thing. Your recordings will be more natural and, as a result, more interesting and effective.

A tape recorder is an amazingly versatile tool. But that is

all it is—a tool. Any tool, even the finest, is of little value unless it is used properly. The most versatile tool imaginable can turn out sub-standard material or perform inadequately if the person who uses it doesn't understand its capabilities and limitations thoroughly and know *how* to use it.

One purpose of this book is to point out a few "hows."

PART TWO

5. "SOUND" RECORDS

**6. MARKETING
ADVERTISING—SELLING—RETAIL BUSINESS**

7. EMPLOYEE TRAINING

8. AUDIO AND VISUAL PRESENTATIONS

9. GENERAL BUSINESS USES

LISTEN *to this*
REFRIGERATOR
TALK...
OPEN THE DOOR!



CHAPTER 5

"SOUND" RECORDS

A TAPE RECORDER is just what the name implies—a device for making *records* on *tape*. For business men, these records serve many purposes . . . and while they are *sound* records, they can replace many other kinds of records which formerly required much more time, effort and money to produce.

Every day more uses are being found for sound records on tape. For example, the day is coming when, to get a job done exactly right every time it's done, you'll do it yourself just *once*! However, when you do it that one time you'll probably have a silent partner—a tape recorder.

There may be no actual "sounds" involved in what you are doing, but the recorder will "hear" something just the same and put everything on tape. The tape will then be used to actuate some kind of computing device which will control a machine that repeats your operation down to the last detail.

Fantastic? Yes, but it's already been done! The General Electric Company had an operator guide a lathe through one particular operation while his every move was recorded on tape. When he finished the tape was used to operate a computer mechanism which in turn controlled the lathe, duplicat-

ing exactly what had been done by the workman—automatically!

By stretching your imagination, that tape could be classified as a “sound record,” even though it contained nothing more than magnetic impulses in the supersonic range.

Even pictures can be recorded on tape. As this book is being written, there is good evidence to indicate that the day is not far distant when television programs—and probably even movies—will be recorded on magnetic tape rather than film. Carrying this just one step further, the printing of the future may easily be done from tape recordings rather than engravings and type.

But there's no need to look into the future to find the value of the tape recorder as a tool for producing valuable business records. Such records can be roughly divided into three fundamental classifications:

1. Temporary
2. Semi-permanent
3. Permanent

Tape recorders can do a valuable job on all three kinds.

TEMPORARY RECORDS

If they had no other value, the chances are that tape recorders would continue to grow in popularity just as the modern approach to correspondence. As a medium for the transfer of thoughts from one person to another—or, probably more important, from one group to another—the tape recorder has already proved its worth.

Just for one obvious example, take the case of communications between an advertising agency and a client. A new campaign is in the making. The agency plans board has spent many hours kicking around possible approaches and has settled on three or four which they consider the best bets. Now, it's up to the account executive to present the ideas to the client.

The usual method is to prepare a written presentation. First of all there are pages of scribbled notes—the media director's views, the art director's approach, the production manager's

estimate of costs . . . and so on down the line. For the account executive this means valuable hours to organize the material—then dictate it.

More man-hours are expended as a secretary transcribes the dictation. But finally everything is set in sterile, typewritten form. On to the client to be read by the advertising manager, his assistants, the executive vice-president, the sales manager . . . and so on up and down the line. Again, valuable man-hours expended in the course of absorbing the agency's suggestions. Then another round of discussions, notes, organization, dictation, transcription . . . and back to the agency.

How much simpler it would have been to have each of the members of the agency "team" record his suggestions on tape—with the proper emphasis on the right words and phrases—and send the tape, itself, on to the client. If a file copy is necessary, a duplicate tape can be "dubbed" quickly—or, if need be, a secretary can transcribe the notes directly from the tape.

At the client's end, the whole group can get together and listen to the proposals—or the individuals can listen to it one-by-one. Listening takes far less time than careful reading, frequently with less chance for misunderstanding.

Simple? Yet this basic idea has thousands of applications in business and industry. To do the job most effectively takes adequate pre-planning, but the total man-hours expended is far less than by written communications.

Then take the case of the poor engineer who is a whizz at figuring out new applications for the company's product—or ways to cut costs in production. But ask him to take note of the slogan on the wall which says, "Put it in writing," and he just shrugs his shoulders and replies, "Who, ME?"

At first he may have "mike fright," but chances are that this will be overcome much more easily than trying to convince him that he can write anything but a Christmas thank-you note to Aunt Minnie. Interview him a few times with a hidden mike and he will probably soon come to respect the tape recorder as his ally.

Such examples of correspondence by tape recording are only

a "starter" for putting this new communications tool to work on temporary sound records for your own business. In such temporary uses the tape recorder is at its best from an economy standpoint. When records are needed only for a few days or a month or two, tape economy is at its maximum. And so is the accuracy of the records stored on the tape during this period.

But consider some of the many other temporary sound records which can be tape recorded:

Briefings Busy executives can't afford the time it takes to keep up with the highlights in the daily and weekly trade publications. Neither can they afford *not* to keep up. The answer is simple—a secretary or some other trained individual reads the periodicals thoroughly and digests the important news and features on tape! The busy executive listens to a ten or fifteen minute recording of all that is important to him and then, if necessary, checks for additional details on some especially significant item. He doesn't even have to do his listening at the office if he doesn't want to. He can play the tape in his car or at home.

Tape briefings are also valuable in organizations where work continues for more than one shift. A shop foreman, for example, can leave a "progress report" on tape for his relief. This ensures that some special or important project won't suddenly come to a standstill. Getting plant supervisors—or sometimes more important, individual workers—to leave written reports is a tough job. But merely saying a few words into a microphone makes it a simple matter.

The same theory applies when key personnel are going on a vacation or a business trip which takes them out of the office for an extended period of time. Verbal "jottings" can be recorded at the time a project is in the works, with instructions left for when it is to be resumed again or when additional action is needed at some definite date. And, when the individual returns, he can get a complete progress report of what took place while he was gone in the same method—

without the often difficult task of locating everyone who has the answers and then trying to fit the pieces together.

Salesmen's Call Reports Call reports are frequently a salesman's biggest headache. He waits until they pile up on him—and then usually insists, "I know I made some other calls, but I can't remember where." Even if he keeps a complete record of how he spends his time, he will probably claim he can't remember just how the interview went.

In any event, to the average salesman a call report is an undesirable task—but not so with a tape recorder. Good salesmen are natural born talkers—but seldom "natural" writers. It's a simple task to throw a switch and start talking, giving a blow-by-blow description of calls. While this, in itself, may be a problem in some cases—particularly with the prize office windbag—it is paying off for many companies.

A large California printing company, for example, has nine salesmen covering the entire East and Midwest. They found that their written sales reports were sketchy with important details frequently missing. The division manager equipped the men with tape recorders. After a day's work the salesmen go back to their hotel rooms and dictate more on tape in minutes than they formerly put on paper in hours. The tapes are mailed to the home office where the division manager personally listens to each one. Important information is noted or, if the complete tape is considered valuable, it is filed for future reference. Unfiled tapes are used for replies to the salesmen.

In other cases, the tape recorder serves as a dictation machine for the salesman, with a secretary transcribing the call reports back in the office.

Recorded call reports are especially simple for the salesman who has his car "wired for sound"—a tape recorder connected to the automobile's electrical system through the use of a power converter. It's an easy matter to record a sales report while driving between calls, when the memory of the call is fresh as to just what took place.

With a tape recorder, it isn't even necessary to "dictate" the reports in many cases. Far too often, important information gets garbled in "translation" by the salesman. With a recorder he can get the customer or prospect to record his comments directly for transmittal to the home office.

Expense Accounts Call reports aren't the salesman's only use for a recorder. One large company, for instance, with many salesmen working out of the home office, has found that it can work wonders with expense accounts.

Tape recorders had already been used successfully in many of its sales operations when one far-sighted company executive suggested the use of tape recorded expense accounts to replace the standard written reports. Taped expense reports are now submitted by all salesmen on a weekly basis. A careful analysis over a relatively short period of time confirmed the wisdom of this suggestion. It disclosed a positive trend—expenses had decreased approximately 20%. It's a bit hard to explain, but people just seem to bring their most "honest" side forward when they're talking into a microphone.

Data Transmission It isn't only salesmen and the sales operation which benefits when a tape recorder is used for temporary records. Take the case of an eastern bank which wanted to streamline its record keeping activities.

Banking procedure, of course, dictates the necessity for keeping positive, detailed records of every transaction no matter how small or transitory. This frequently involves much paper work on records that are only temporary.

To make this task easier and more economical, the bank now keeps an increasing number of its temporary records on tapes. The first step in this direction was with checks which are transmitted every afternoon to a clearing house. Once the checks have cleared, the records are of no further value. Keeping written records involved not only tedious hours of work but also a waste of paper and supplies. Using tape recorders,

the time as well as the cost has been materially reduced. A clerk now merely reads the necessary information from each check before it goes to the clearing house. His vocal "notes" are recorded on tapes, which are kept for 30 days and then reused.

Because of the speed and simplicity of making tape recordings, the data now kept is actually more detailed than that which was written out under the old system. Among other benefits, the bank reports that the tapes have proven invaluable in tracing lost checks.

There is no reason, of course, why such streamlined methods need be limited to banks. Almost any business has similar operations . . . and can readily apply the tape recorder to cut costs and reduce chances for error.

Order Filling While it would be impossible to describe even a small percentage of the applications of a tape recorder for data transmission, a good general application which has uses almost everywhere is order filling by tape recording. It should immediately suggest tape recorder applications for most any business man.

Take a typical case: A tape recording is made of a customer's verbal phone order. A telephone pickup device can be attached to the phone and the caller leaves complete details—on tape. It isn't even necessary to have someone who is well acquainted with technical terminology or the stock catalog—all of the customer's instructions are recorded just as they are given. The tape is sent to the stockroom where the order is filled. The same recording serves as instructions for the mail-room—and on to the accounting department. This method offers far less opportunity for error than written orders, particularly when it passes through several hands.

Those who have used the tape recording order system report that it has met with favorable customer acceptance—giving him confidence that his instructions are reaching everyone involved. One plus value is that it eliminates many customer complaints that his order or instructions have been misinterpreted.

Of course, it isn't necessary to limit tape-recorded order taking to direct contacts with customers. Many firms have found it helpful to have their routemen, traveling salesmen, etc., record their orders rather than writing them out. The big advantage here is the time which can be saved and the ease with which special instructions can be given. One firm even has its salesmen use portable tape recorders for on-the-spot orders from customers. The salesman just opens up his tape recorder rather than an order pad and while the customer describes his wants, everything is being recorded on tape. The tape is played back so that the customer can check to see that everything is in order and then it is forwarded to the warehouse for prompt filling—no time delay for written instructions.

Reports Probably the most natural of all forms of temporary records for tape recording is the "report." Reports of all kinds—both lengthy and short—are handled simply and with dispatch by tape recordings. In addition to the obvious advantages of speed and economy, recorded reports help to eliminate chances for error since there are no "middlemen" involved.

Not only can the tape recorder replace the typewriter, pen or pencil for written reports, with many hours and dollars saved in the process—frequently far more than the cost of the recorder—but it can extend the value of reports that normally would never otherwise be recorded in any form. Take just one simple example:

The boss wants to know the advantages and disadvantages of various methods of producing a particular item. He has to know the answers within a few hours and calls in his production chief, who gives a good run-down on all of the possibilities. Comes time for an executive board meeting a couple of hours later and various executives raise important questions. The production chief, meanwhile, has taken off on an assignment out of the office. If the verbal report were tape recorded, it's immediately available for analysis and comment and the necessary decisions can be made without costly delay.

Field Contacts A tape recorder is also an ideal medium to keep in touch with field salesmen or branches in other cities. It's an ideal way to send detailed information both ways—frequently saving large sums of money in railroad fares, long distance phone bills, lengthy dictation and transcription sessions, etc. In addition to saving time and money, it is also much more personal than other forms of correspondence and permits the inclusion of many valuable off-hand remarks and comments which would normally be omitted from written reports.

Exchange of Ideas This is admittedly a "catch-all" category, but nonetheless, an important one. Many important business developments have been the result of two or more people just sitting down and discussing things. But, in many cases, such opportunities for an exchange of thoughts just never develop.

Thoughts have a way of losing their clarity when put down in black and white—but when recorded while "in the mood," they can be passed along to others for development.

This book, for example, probably never would have been written except for the exchange of ideas between the co-authors on tape.

Employment Applications When it is extremely difficult or almost impossible for a personnel manager and a job applicant to get together in person, a tape recording is frequently the next best answer. This is particularly true when a number of different applicants are being considered for the same job.

A large chemical company, for example, was in need of qualified personnel for a highly specialized job. Interviewing numerous applicants, to find the few who had the specific qualifications desired, would have been quite time consuming. An ad was placed in various newspapers. Interested applicants were directed to telephone a private recording service. Each individual dictated his qualifications over the phone. It took only about five minutes to collect the résumés of nine indi-

viduals. In view of the nature of the job involved, normal interviewing techniques would have required a full day's time of a personnel man.

There are many large companies who use field recruiters to search out qualified personnel for jobs in the home office. Recordings of their interviews with various candidates, returned to the home office, provide the personnel manager with much more between-the-lines information on which to base a decision than he could get from a written report.

Dictation There is still room for much improvement in the average "general use" tape recorder when it comes to dictation, but some models can be used quite successfully. Manufacturers of tape recorders are making great strides at this writing to solve some of the basic problems in adapting their recorders for general dictation use.

In the past, there have been two major difficulties in using tape recorders for dictation machines—(1) inserting recorded tape into the machines, while a relatively simple matter, was more difficult than setting up machines which use other recording media and (2) back-tracking was a hand operation. The use of tape cartridges promises to solve the first of these problems and adaptation of foot pedals used for other types of dictation machines may solve the second problem.

The main advantage a tape recorder has over regular dictating machines is fidelity of sound. You'll get no more letters addressed "Dear Mr. Knothead," when it should have been "Dear Mr. Lockhead." There is, however, another major advantage—the *same* machine can be used for so many other purposes.

Secret Meetings In every organization there comes a time when it is essential or desirable to hold a "closed meeting" on some particular topic. Frequently at such times, the persons involved in the meeting would prefer not to include even a private secretary. But it's imperative to have a record of what was discussed. Again, the tape recorder is the answer. The complete proceedings can be

put on tape. When the tape is no longer needed it can be erased and used again, with no one except the original parties involved in the meeting knowing what was said and by whom.

Official Messages Probably nothing is accepted with as little enthusiasm as the annual "progress report" or "Christmas message" from the boss. It is difficult to make a quantity-produced letter seem personal to the recipients. While a recorded message can't completely overcome this difficulty, it does give the boss a chance to include a degree of warmth and enthusiasm.

Inspection Another use of the tape recorder for temporary records is to serve as an inspector. For field checks on equipment such an application can be especially important. In a typical case, the man with a recorder sets up "shop" right at the installation and gets valuable information from those who use or service the equipment. In many cases, even the sounds of the equipment in operation can be important. A good technician can frequently recognize faults in a piece of equipment just by hearing it in operation. If that technician is hundreds or thousands of miles from the scene of operation, the company well may be saved heavy travel expenses and lost time by getting the recording, analyzing the sounds and comments and sending corrective suggestions by wire, phone or return tape recording.

Even if the technician is on the spot, he will find a recorder valuable to eliminate complicated note-taking and preparing written reports.

SEMI-PERMANENT RECORDS

As in the case of temporary records, the tape recorder is particularly valuable for semi-permanent records because of the economy factor. Records which must be kept only for a few months or a year are ideal for tape because when they're no longer needed the tape can be re-used at no additional expense.

Telephone Conversations A typical example of preparing sound records on tape for semi-permanent records is the recording of telephone conversations. The practice of recording all long distance or overseas telephone conversations is becoming increasingly popular. With a tape recorder to take down every word of both voices, each individual is left completely free from the distractions that usually result from note taking. If necessary, a written transcript can be prepared from the tape recording when the call ends but usually this is not necessary as one or two play-backs provide any information needed to take action. The tape, however, remains as a semi-permanent record, until the project is completed or outdated.

Actually, a tape recorder can save many dollars in the "mechanics" of some types of long distance calls. When it is necessary to transmit lengthy information over the phone, it can be pre-recorded at a very slow speed. Then, when the phone line is open, the recording is played at several times the speed of the original recording and re-recorded at a similar speed on the other end of a line. To bring the recording down to an understandable level, the re-recording is played back at the speed at which the original recording was made. In this way it is, for example, possible to transmit an hour recording made on a 1½ inches-per-second in only 7½ minutes by boosting the speed during transmittal to 15 ips.

This method is frequently used to transmit lengthy messages overseas. Many radio programs are transmitted to foreign stations in this manner. It, of course, combines economy with a minimum chance of error . . . and automatically provides a "sound record" of the material transmitted in this fashion.

Be sure to check with your local telephone company whenever you plan to tape record telephone conversations. In most cases, a "beep" signal *must* be used. This is a device which, through regular "beep" noises, notifies the person on the other end of the line that you are recording his conversation. It is not enough just to have the approval of the person or persons involved. The Federal Communications Commission—and, in most cases, state laws—require the use of a "beeper." Because

of differences in various state regulations, however, it is important to check with your local phone company for details. In the majority of cases, the signal, itself, is "inserted" by the telephone company whenever requested, although there are occasions when it is possible to use a special device which does double duty as a "microphone" for transmitting the conversation from the phone to the recorder and as a "beeper."

Sales Meetings One of the biggest problems in business communications is in getting full value out of sales meetings. The common problems are legion—too much to do in too short a time . . . "covering" people who should have been there but weren't . . . organizing spontaneous ideas into workable sales-boosting aids . . . etc.

While a tape recorder can't lick every problem of every sales meeting, it can prove to be a vital tool. First of all, the recorder can extend the value of the meeting to those "who should have been there but weren't." The simple way is to record the entire session and send tapes to the individuals who were absent.

If time permits—and particularly if there are lots of people to cover—it is well to edit the tape to eliminate "dead air" and comments of little or no value.

These taped records can prove of value for people who "were there." Frequently, due to limited time, it is necessary to conduct more than one meeting at the same time. When it is not feasible to hold two sessions on the same topic, a tape recording solves the problem of providing everyone with a record of what transpired at each meeting, whether he was there or not.

Another value is to fill in the man who has to spend most of his time making arrangements, keeping things moving on schedule and tending to the 1,001 details that are always popping up. Far too often, the sales manager or other key executives have to miss out on valuable information because they are too busy running the show.

Probably even more important, however, are complete sales meetings on tape. No longer is it necessary to call off all sales

operations for a week or so just to get the sales staff together to pass out vital information. What would normally be presented to the group is tape recorded instead and the tapes sent to the men in the field.

Recorded sales meetings usually start off with a presentation by top sales officials, who send their comments to interested parties for comment. The comments, in turn, are recorded on tape and sent back to the home office where they can be digested and distributed again by recording. This gives everyone a chance to be heard—with thoroughly thought-out answers, rather than a lot of spur-of-the-moment comments.

There are several advantages to this technique. First of all, it's fast. What might easily take weeks of planning and execution can be completed in a few days. The economy is also obvious. Then, too, it reaches branch offices and field representatives at their points of operation where they can call upon their files, assistants and close contacts for vital information.

Tape recorded sales meetings can never replace "live" ones, but they can add a new dimension to the entire sales operation. A key point to remember: be sure to give the person on the listening end a chance to "participate." You'll have to apply much the same psychology used for any group meeting to keep the audience attentive and responsive—only it will have to be more obvious since distractions are frequent when only the ears are required for basic participation.

Another point worth considering for companies who have salesmen on the road—particularly those who drive—is that recorded sales meetings can actually fill in otherwise dull and non-productive spots in the salesman's day. The meetings can take place right in his car as he drives between calls, hitting him during "working hours" when he is most apt to be giving full consideration to his job.

Interview Reports No need to make written reports of interviews when a tape recorder is available—the interview, itself, becomes the report. This can

be particularly valuable when the way in which questions are answered is important.

Frequently sales, production or merchandising decisions must be based upon a careful analysis of information which has been obtained over a long period of time. The comments of everyone concerned with a product or service should be considered.

Far too often, the actual "meat" of such comments has a way of getting "lost in the shuffle" and some of the more current thoughts dominate all thinking on the subject. This is a time when tape recorded interviews can become vital to the success of the particular project. No matter how long ago they were recorded, the tapes can bring back the full flavor of what was said and help to bring all valuable ideas into clear focus.

Inventory Reports Inventory reports, particularly those sent from one office to another, frequently are slow and costly. But here, again, the tape recorder has come to the rescue. The clerk records into a microphone as he checks the stock—without eliminating valuable comments because they take too much time to write down. ("Ten model z-1 widgets, catalog number 581-Z-10 . . . three in old-style cartons . . . one with a damaged flammings cam . . . seven widget tool kits . . . etc.")

The tape, of course, can be transcribed directly to whatever accounting system is used, with little chance for error and much time saved. Because of the ease and speed of recorded inventories, it is frequently possible to make them at much more frequent intervals without any work stoppage or need for additional personnel.

No matter what the business operation, tape recorders can be a valuable tool when it comes to inventories. Take the case of railroads, for example. Several railroads are using tape recorders to control the disposition of freight. Yardmen using a walkie-talkie relay the location and content of individual freight cars to a central office. Each message is tape recorded and the spotter goes on to the next car. Under the previous

system, the information was relayed only once and errors were numerous. Now all information is recorded before any bills are pulled. As the tape is played back, with the opportunity to repeat as frequently as necessary, each bill is pulled in sequence, eliminating any chance for error.

A modification of this system can be applied where a running inventory must be maintained on a minute-to-minute basis. One important feature is that the original voice record is always available for back checking, helping to find errors quickly if they should develop.

Delivery Control Department stores have been saving money by eliminating paper work through the use of tape recordings of package delivery instructions. A Columbus, Ohio, department store, for example, uses recorders to maintain a day-by-day record of: a) a departmental charge of every delivery; b) requested time of delivery; c) all parcel post and express shipments; and d) delay of packages requiring repackaging. The accounting department transcribes the information from the tape directly to IBM cards. The tapes are retained for a specified period then reused.

Check-Cashing As an added safeguard against check-passers, currency exchanges and retail stores are making recordings of each check-cashing transaction. The person is asked to state his name, address and identification data. Organizations using this system report that it has resulted in a definite reduction in the passing of worthless checks. It seems that would-be phony check-passers don't like the idea of leaving "vocal finger prints" on record. The recordings are saved until the checks have cleared then put back into circulation.

Labor Relations In cases of critical labor negotiations, tape recordings of discussions between union and company representatives can be played for all plant employees to keep them posted on the status of negotiations and without any opportunity for distorted views. Such

recordings are also a valuable record in case of later controversy—and an opportunity to brief others on just what took place.

Another interesting use of the tape recorder under similar circumstances is a technique developed by Reuben B. Robertson, Jr., president of the Champion Paper & Fiber Company, who relies on tape to bring management and labor together.

To translate the sterile words of Champion's annual stockholder report into something of significance to interested employees, Robertson tape recorded a question and answer session between selected employee representatives and himself. The interview was presented to employees—verbatim. Champion workers got answers to questions of vital concern directly from their president—the general financial condition of the company, prospects for future business, the possibility of a recession, job security, and many other topics not usually covered in written communications originating in "the front office."

Liaison "Spreading the word" quickly and accurately can often spell the difference between success and failure of a special promotion campaign, a revised sales program, or any other business operation where communication of information is vital.

The Baltimore Police Department has used tape recorders in a way that should provide plenty of food for thought for many businesses. The Baltimore police had a problem of communicating information at least once each hour to about 500 different call boxes spread throughout the city. Eight central switchboards and 24 men were needed to keep up communications during a 24-hour period. Every time a patrolman called in, the operator had to repeat *all* messages current at the time.

Then came tape recorders . . . and a streamlined operation. Now when a patrolman makes his hourly phone check, he hears a tape recording ranging from ten seconds to two minutes in length. After a short pause, the tape repeats itself and the patrolman can pick up any information he may have

missed the first time. New information is added to that already on the tape and complete revisions are made hourly.

In another instance, tape recorders are used to record all incoming emergency messages. In this case, the tapes have proved valuable for rechecking original information and in fixing the "blame" in case a wrong address, inadequate information, etc., is given.

Either of these systems can readily be applied to businesses. It can prove valuable where a large number of employees must receive instructions frequently during a day's work schedule. It can save both time and money. Take the Baltimore situation—according to the superintendent of Baltimore's police bureau of information, the recorders paid for themselves in a matter of weeks since it now takes only 12 men to do a job that formerly required 24.

Accident Reports Tape recordings have come in mighty handy for industrial plants faced with safety problems. They are being used to record accident reports.

On-the-spot testimony of witnesses is often invaluable in determining the cause of accidents and the exact sequence of events involved. Such timely and accurate testimony is useful in making claim adjustments and deciding upon any future action which the circumstances may dictate.

Complaint Handling Handling of customer complaints has been greatly simplified by the use of tape recorders. Instead of complaining in person to a complaint clerk, the customer merely pushes a button and talks into a microphone. The same technique, with minor variations, can be applied to telephone complaints. Not only does the use of a tape recorder reduce personnel costs, but it assures relay of accurate reports to the people directly concerned. It has also been found that the use of recorders has a tendency to reduce "crank" complaints. People, it seems, are reluctant to go off the deep end when they know that a record is being made of what they say . . . and they are more apt to stick to facts.

PERMANENT RECORDS

Permanent records form the keystone of all business activities by providing the facts and reference data on which to base future plans and operation. Accuracy and comprehensive detail are all important—and tape recordings can qualify on both counts.

Indexing Before discussing actual examples of permanent tape recorded records, it is well to mention one very important factor—*permanent record tapes are almost useless unless they are supplemented by a good visual index system.*

This, of course, is true of almost any collection of permanent records, but is even more important when it comes to tapes. While you can easily scan through visual records when trying to locate some elusive information, scanning by ear through large files of tape is next to impossible.

No matter what kind of permanent record you put on tape, you'll want to have a simple, yet fairly inclusive index. This, in no way, detracts from the basic time-and-money-saving values of tape recorded records for such indexes seldom require any more than a capsule outline of tape content.

There is no perfect indexing system which will fit every application, but the following suggestions may prove helpful:

1. Use *time* as your basic element for location of material. All you need to know is the speed at which the recording was made and the reel size used and it is a simple matter to locate any portion of a recording. For example, take a seven-inch reel (1,200') of standard recording tape recorded at $7\frac{1}{2}$ ips. If fully recorded, it will contain one-half hour of recording. Break down the material on the tape by minutes and you will have 30 minutes for indexing, each one composed of 40-feet of tape. One particular item might have been six minutes in length, recorded from the eighth through the thirteenth minutes on the tape. Therefore, your index would probably show:

Subject—Reel No.— $7\frac{1}{2}$ ips.—8-13

2. It is important to include complete recording information such as the speed at which the recording was made, type of tape used (if your organization uses more than one type), if the tape is recorded in one or both directions, etc. This will save valuable time when replaying.

3. Label both the reel of tape and the box. Tapes have a way of always ending up in a different box, with plenty of confusion as the result. On the box it is well to index contents of each reel—but don't count on this as your only index unless you have but a few reels on file.

4. Don't be afraid to break reels of tape down into smaller units. The added cost of storage space will soon be compensated for in man-hour savings. If you have several unrelated subjects on a single reel of tape, cut them apart and rewind them on empty reels. At the same time it is helpful to combine related recordings on the same reels. A word of caution: if you've made dual track recordings (recorded in both directions on the same tape), you'll destroy one of the recordings when cutting the tape apart. You can, of course, rerecord one of the tracks.

5. A handy method for separating different portions of a tape and yet keep everything on a single reel is to insert a length of paper leader tape between the sections. It is easy to spot these dividers just by looking at a reel of tape (they show up as a white line) and you can write on the leaders to carry your indexing a step further.

6. Don't forget that what may be a file of just a few reels today, with the contents of each individual reel easily remembered, may grow like Topsy. It is better, right from the start, to assume that you are setting up an index system for a large library of tapes. Index and cross-index thoroughly and it will pay off in the long run.

But just what kind of permanent tape recorded records are there to be indexed?

Records of Important Meetings

Who said what to whom, when and how, at stockholders or board of directors meetings? An accurate record of the complete discussion of a major issue can be extremely significant to those charged with the responsibility for implementing a program or showing why it shouldn't be adopted.

Not only are such recordings valuable for normal business reference, but they form the basis of a complete history of important moments in the life of a company. Any business historian would give his eye teeth for a complete set of such tape recordings when preparing that special book for the 50th anniversary celebration.

Legal Facts

Tape recorders can replace courtroom reporters, or at least supplement their written records. Courtroom recordings can be of special value in trying to prove or disprove grounds for retrial. More and more lawyers are beginning to use recorders right in their own office, to record facts cited by clients and witnesses.

For legal as well as other reasons, the Los Angeles Department of Water and Power records all radio communications with its mobile units in the field. The practice was begun for the purpose of providing protection against possible damage suits and the Department's legal section frequently plays back the recordings when preparing a case. The recordings establish the exact sequence of events and specific occurrence and provide conclusive evidence of the extensive efforts made to rectify any damaging situations of which the Department is informed.

Other significant advantages of tape recordings noted by the Department, in addition to those of a legal nature, include closer supervisional control over men in the field due to the ready availability of tapes for playback and positive establishment of a particular individual's responsibility in the case of conflicting orders.

Medical Records Doctors have begun to keep a "sound library" containing physiological data. Cardiac specialists are building tape files on each of their patients. They record and study heartbeats.

Druggists are using tape recordings to establish proof that a physician has given verbal authorization for the refilling of prescriptions in certain categories. The recording of the doctor's voice has been used in lieu of a written prescription.

Because of the tape recorder's ability to record low-volume sounds and amplify them considerably, they are being used diagnostically to listen for rhythmic breathing.

Mechanical Sound Library Garages and others who deal with machinery are building up libraries of engine or machine trouble sounds. Thus, by comparing the sound of a troublesome engine or like machine with the sounds on file, the difficulty can frequently be determined without extensive investigation.

Libraries of this nature are particularly helpful for training purposes. It's impossible, of course, to describe sounds in words and pictures—yet sounds constitute one of the most important factors in many types of training . . . and tape libraries are bridging the gap.

Performance Checks Tape recorded mechanical sounds also can play a vital role in manufacturing. Take, for example, the case of a major air conditioner maker who is using tape recorders to check the operating noise level of units rolling off its assembly line.

This manufacturer discovered that a significant sales factor in air conditioners purchased for homes and offices was the volume of noise produced while the units were in operation. Tape recorders were put to use to detect noisy units in the plant—before they could show up in a customer's home or office with resultant dissatisfaction.

Recordings made of defective units are put on file, where they play an important role in the manufacturer's service operation. Now, when field repairmen have difficulty in diagnosing

the cause of trouble in a balky machine, they record the sounds it makes and send the recording to the plant. By comparing these tapes with those from the permanent tape library, plant personnel can usually diagnose the trouble quickly and send back an immediate report.

Effective Speeches or Presentations There are momentous events in the life of every company regardless of size—the dedication of a new plant or the opening of a new store, for example. Recordings of the speeches at these events often make good fuel for future use as inspirational or motivational vehicles, as well as a historical record.

Every company has one salesman who is head and shoulders above his co-workers. A recording of a "How I Did It" speech of his makes an excellent permanent case history for present and future use with other salesmen.

A midwest insurance firm—the Combined Insurance Companies of America—makes a regular practice of sending "motivational" recordings to all its offices throughout the country. A respected "expert" tells how he overcame a particular type of sales resistance, or how he exercises mental discipline to keep himself at peak efficiency. Branch offices get the tapes free. They have the option of returning the tape within a certain period or keeping it and paying the home office the price of the tape. The company received payment for almost 2,000 tapes in just three years!

Job Descriptions The practice of tape recording job descriptions is becoming more and more prevalent. It has been discovered that for certain individuals and certain jobs, a verbal job description and job analysis is more effective than one that is written. Some employees can retain more by hearing what they are expected to do and how they are to do it than they can by reading it.

Analytical Reviews Probably even more important than the other types of permanent tape records already mentioned is the analytical review or critique.

There isn't an individual or organization which can't readily utilize its tape recorder for this purpose. Case histories involving analytical reviews are far too numerous to single out more than a couple of general examples:

Suppose, for example, you have just completed a particularly successful convention exhibit—or a particularly unsuccessful one for that matter. In the hotel room following the big event, with the exhibit all recreated and consigned to the movers, the Monday morning quarterbacks feel a compulsive urge to start talking. The gripes, the groans, the compliments and all manner of comments have a way of flowing forth with freshness and a to-the-point quality which can never again be recaptured—*unless* they're recorded right then and there.

A year later, when it's time to prepare again for an exhibit at the same show, the tape recording can prove to be the most valuable element in getting things off to a fast start. No chance for the all-too-common, "Now, what was it I decided to change the next time we did this?" It's all down as part of the permanent record.

Or take the case of an industry open house. All kind of committees and individuals work long hours to work the "bugs" out of such an event . . . but when the event is repeated some years later, many of the best workers on the original event are no longer around—or if they are they've forgotten the "little" things that have a way of growing big quickly. A series of tape recorded critiques by all committees, of course, can save time, money and effort and produce better results.

Apply the same technique to a "Spring Clearance Sale," a sales meeting, a promotion campaign, a party, a press conference, a special edition of a publication . . . or even the year's business. It can pay the entire cost of a tape recorder many times over.

There are many other types of records that can be filed on tape. But the preceding examples of how tape recorders are being used in business should provide a starting point for working out your own applications.

CHAPTER 6

MARKETING

ADVERTISING—SELLING—RETAIL BUSINESS

WHILE THE tape recorder is an excellent "office" appliance, it really comes into its own "in the field." For businessmen who already are using recorders on their field trips, it is hard to imagine how they ever could get along without one.

Two of the major tape recorder advantages are important for field recording—portability and versatility.

Today, the businessman can buy a tape recorder with almost any desired degree of portability—from the size of a shaving kit to that of a large suitcase. Of course, the smaller the machine, the fewer qualities—other than portability itself—it possesses . . . but even the smallest machines can do many jobs better than the early models available a few years ago.

The biggest attribute of the tape recorder in the field, however, is its versatility. One unit can take the place of several persons and other machines. The tape recorder becomes a secretary, a top-notch salesman, order-taker, engineer, supervisor . . . and general handyman. It can convert idle hours into productive time and add a degree of efficiency to many operations previously impossible.

Field uses of a recorder are legion, but the following ex-

amples indicate the outstanding versatility of this new business "handyman." For purposes of illustration the examples have been broken down into three broad, generalized categories—*Sales, Advertising, and Retail Business.*

SALES

Sales Conferences A sales conference is tantamount to a capital investment. Almost every investor keeps accurate records of his investments. Its only logical that ad managers, sales managers and anyone else connected with sales campaigns, as well as the actual "nuts and bolts" of selling, should do the same with his investment and keep records, too—on tape.

Many hours, sizeable amounts of money and much effort are the prime ingredients of an effective sales conference. Letting all this pass into limbo when the "experts" stop talking and the conference ends, amounts to sheer waste.

If it's a good sales conference, the pep talks, strategy, information about competition, etc., are worthy of being repeated—either for the same audience at a later date, or for a different audience located in another area.

Tape recorded sales conferences can be sent to remote field representatives or branch offices distant from the home office in cases where a staff couldn't attend the original meeting either for lack of time or because of high travel expenses.

Sales Training Someone once defined a salesman as: "A Vermonter who can make a Virginian admit to having a Southern accent or a Virginian who can get a Vermonter to acknowledge the 'r' in his pronunciation of 'Wa(r)shington.'" (If you're a salesman and you've never tried this—don't; it can be disastrous to the ego.)

Too few people—salesmen included—realize that their voices and speaking mannerisms sound different to others than to themselves. They work up a guaranteed-to-sell-'em-not-once-but-twice presentation. It's so lucid, logical and lachrymose that the prospect can't help but succumb.

There's only one trouble; the prospect *doesn't*. Something is wrong. Very possibly it could be the tone of voice, inflection, word choice or some other similar factor.

If that salesman would deliver his presentation into a tape recorder and then listen to himself *as others hear him*, he'd probably be uncontrollably startled at what he hears. The first time many people try this they are firmly convinced that something is drastically wrong with the recorder. Unfortunately this is not the case. A tape recorder mirrors the actuality of sounds with amazing fidelity.

Sales training sessions often use the device of having a trainee present his story to another trainee or to the instructor. When he finishes, his efforts are criticized and any faults pointed out. Often the speaker doesn't comprehend the corrections because he sounded different to himself. A trainee can argue with his instructor's or his fellow sufferers' comments. He can't argue with himself—on tape. It's worth a test. Try it—on yourself or the men who work for you.

Another twist is effective, too. Let new salesmen hear a recording made of a veteran in an actual selling situation—overcoming objections, leading the customer into the right frame of mind, and closing a sale.

For additional ideas and suggestions on using tape recorders for sales training, refer to Chapter 10.

Tailored Sales Presentations There are times when, for reasons beyond control, it isn't possible to make a personal presentation to a prospect. What's usually done is to submit a written presentation with as many illustrations—photographs or drawings—as time and money permit. From there on the salesman has to take his chances with the recipient interpreting the literary and graphic efforts exactly the way the originator *intended* to have them interpreted.

Odds are that the man who receives the presentation has a tape recorder—or at least access to one. If a tape is sent, *to be played in conjunction with the review of the presentation*, the handicap of the salesman's absence is considerably reduced. The presentation can be personalized by the use of a casual,

conversational commentary on tape; by using the prospect's name; by including parenthetical insertions and appropriate anecdotes. This is an excellent way to approach the "unapproachable" sales prospect.

Market Research Here's one place where a tape recorder can really hold the spotlight. "Interviews in depth," "group exploration," or whatever term you choose to call this technique, is becoming as much of an essential in advertising and sales as is the charcoal gray suit to Madison Avenue copywriters.

For interviews in depth you can't beat a tape recorder. The interviewer's attention isn't distracted by note-taking. The interviewee doesn't have to slow down or repeat so that something can be written on a piece of paper. The voice inflections and reaction time can be accurately captured on tape. The interviewer's memory doesn't have to work overtime to remember whether it was Mrs. Zilch or Miss Klutz who made the particular remark written on the back of the torn envelope clipped to two different data sheets.

And when you've got the finished tape, it can be played back once or 100 times; for one person or a large group. It's true, the tape will have a number of unnecessary items on it—but it also has *all* of the essential items, *exactly as they were* spoken, for transcription to paper—if a written transcription is desired.

Another valuable asset of present-day recorders is their ability to capture unrehearsed, candid comments. A "hidden" recorder—concealed in an innocent looking brief case—is often the only solution to getting otherwise unobtainable information from customers, prospects or competitors. As long as such recordings aren't used for advertising purposes—verbatim, that is—or in some way which causes embarrassment to the persons whose remarks were secretly recorded, the individual who made the recording is in no danger of lawsuit. The use of common sense and good taste are usually sufficient guides in determining how these tapes and the information they contain may be safely used.

In many instances no special "tricks" are needed to obtain market research data in the field. The majority of people con-

tacted are quite flattered that someone is interested in their opinions. They volunteer information readily and are almost eager to have their comments recorded in their entirety.

Interviews with Dealers This category is loaded with possibilities and could easily be the subject of an entire chapter covering nothing else. The interview we're discussing is one for publication—*audible* publication.

Suppose you're considering a major overhaul of an advertising campaign, a radical redesign of a product, its package or its price. Should you or shouldn't you? Are dealers satisfied or dissatisfied? Do they want the status to stay quo or would they like a change? You may or may not have a preconceived idea of the answer—but—either you don't want to spend money or your boss won't let you spend money to make changes without some kind of proof positive.

Why not strap on your tape recorder, tell your secretary you won't be around for a while and go talk to some dealers? Let them know you're recording their comments. Tell them it's all in the interest of science—you want to analyze their comments later, back in your "laboratory." You want to compare the reactions of metropolitan dealers with suburban dealers; large dealers with small dealers; satisfied dealers with dissatisfied dealers.

You can use the finished tapes to sell new dealers, to convince yourself (or others) of the wisdom of your plans or the need for a change, or to provide fuel for an almost empty idea larder.

Modifications of this technique are limitless. The point is, tape recordings are easily obtainable and they provide highly tangible, factual, first person records of an existing situation.

Interviews with Users Basically the idea is the same as the one above. In this case, however, you're hovering around home plate. These are the people who determine what type of melody is played on *your* cash register.

If the recordings are for your own ears only, you might want to use the "hidden recorder" technique alluded to above. If

you want to use them for sales or advertising purposes you'd better unsheath your microphone and have a "release form" handy. Unauthorized use of a voice can be just as financially disastrous as infringing a competitor's copyright or patent.

Authorized tape interviews with your customers can serve you in two ways; they can be used for verbatim inclusion in an advertising campaign or they can be used to discover where your present tactics are succeeding or failing.

Also, if you're looking for new outlets for your products, there's nothing like a satisfied customer, *telling* of his satisfaction, to convince someone that he, too, should carry your product, or, if he's already on your list, more of it.

Sales Tool For the salesman, the recorder is also a sales tool.

The same machine which he uses for dictation can be applied to the task of conveying vital information to prospects. For instance, technical matters—particularly those of a highly complex nature—can be explained on tape. Detailed information can be put on tape by technicians in the home office and transmitted to salesmen in the field. The salesman adds his own elaboration, usually tailored for a specific individual, and sends or delivers the completed tape to the prospect.

Another technique is for the boss to direct his personal sales pitch to a specific prospect, via tape. The salesman delivers the tape to the prospect and then adds the extra punch in person.

End-use Reports The tape recorder also gives the company an opportunity to use its salesmen for extra duty—without adding a great deal of extra burden to their regular work load. One of the best examples is the common industry problem of getting end-use reports from the field.

Frequently no amount of coaxing can get the salesman to do a halfway-decent job of furnishing accurate information on how a company's products or services are being used by customers. The task of compiling and transcribing such information often "sells" the salesman into neglecting this important task. With a tape recorder, however, such a job is reduced to a relatively minor burden.

A five- or ten-minute recording session with the customer will often provide vital information essential for sales planning, product analysis, advertising, etc. With a recorder it is usually possible to get such information directly. A local contact is sent a set of questions from the home office. He records the customer's answers on-the-spot, with a minimum of time and effort involved for all concerned.

ADVERTISING

Idea Sessions It's generally conceded that two heads are better than one—unless they're attached to the same neck. Ideas beget ideas. No one person has a monopoly on ideas. One individual can often come up with an idea that is basically nothing short of phenomenal. There's only one trouble; it needs "development." Someone else in the same room often can provide just that "development."

A tape recorder running at an "idea session" attended by department heads, the advertising staff, or an agency-client conference, makes an ideal idea-stimulator. The thinking of *everyone* is consolidated in one neat package. It is possible that nothing specific, concrete or final may come out of the first such session—but—with a tape to play over and over, the odds are that a solution will ultimately develop from the spontaneous, off-the-cuff thinking of a combined group.

Tapes like these make excellent fuel for the ad manager or account executive who's saddled with the chore of "kicking around" the ideas discussed (and cussed) and coming up with a recommended program.

Brainstorming One type of idea session that is growing in popularity among members of the advertising profession is the *brainstorming* technique developed by Alex Osborn of Batten, Barton, Durstine & Osborn. The basic idea of this technique is to get a group of people together and try to come up with just as many solutions to a given problem as possible in a relatively short period of time.

Using the brainstorming technique, it is not unusual for a group of admen to come up with 100 or more specific ideas in

as little as half an hour. While only a small portion of the ideas will actually prove to be practical in most cases, it is important that they all be recorded for future consideration. During a really "hot" brainstorming session, when one idea quickly begets several others, it is common to have as many as 10 ideas suggested in a single minute.

It is rather obvious that the tape recorder is the ideal tool for recording the ideas. To have a secretary call a halt to the idea progression while she "catches up" only defeats the whole concept of brainstorming. The tape recorder, on the other hand, never gets behind and thus can contribute a great deal to the success of this valuable idea technique.

Auditions If you're producing a company movie, planning a series of radio commercials, preparing a slide or film-strip presentation or considering almost any type of audio ad program which necessitates the use of an announcer, narrator or commentator, a tape recorder will help you bat 1,000 in picking the right voice for the job.

By having each prospect record a portion of your script you get two major bonus factors on your side immediately: 1) You'll have a realistic sample of the way the voice will sound when it eventually comes out of the business end of a loud-speaker; and, 2) you've got potential "alibi copy"—a concrete sample to present to your client or anyone in your organization who wants to double check your choice of a voice to handle the job on which his money is being spent.

Incidentally, you'll find that some voices which sound ideal "off-mike" will sound drastically different after electron tubes, coils and resistors get through playing with them. The reverse is also true.

Air Checks If you foot the bill for a radio program, or write the copy, or have almost anything to do with the production, you're not human if you don't want to hear it when zero hour comes and it hits the ether.

Suppose you get called out of town on a business trip during the period the show is due for release. With a tape recorder

you won't have to miss it. Somebody can do an air check for you—record the program right off the air—on a tape, save it until your return and have it warmed up and ready for playing when you walk into the office.

Air checks have other value than ego satisfaction, too. You can replay a program or segment of it as many times as you wish—for analysis purposes. Possibly the commercials should be rewritten, rearranged or used in a different sequence. Maybe you should ask the announcer to make some changes in his style of delivery. Air checks can answer a lot of questions like these.

Eavesdropping This can get you into serious trouble with the Federal Communications Commission—if you don't exercise good judgment. It can also get you some amazing and incredible "horse's mouth" information which is invaluable in planning an ad campaign, outlining a merchandising program or writing ad copy.

Discretion is the watchword here. Use it and you *won't* be sent to the Bastille for invasion of privacy and you *will* get priceless information available in no other way.

You can buy battery operated portables that look like a brief case. You can also buy "midgets" which fit in your pocket, under your coatsleeve or anywhere else you personally prefer to conceal them. With these recorders you can get information from the man—or woman—who knows whatever it is you happen to want to know. The comments will be factual, candid and valid, because unless you want the interviewee to know he's being recorded, he doesn't ever have to find out about it.

You can ask customers to tell you what they think about your product. You can ask dealers to tell you what success they're having selling it. In this way you get the actual *facts* about an ad campaign's effectiveness, a product's customer-acceptance, a dealer's attitude and any number of similar bits of information which you, your boss or client might want to know.

Naturally, if you ever decide to use the recordings outside your own organization, you'd better go back to the source and

get written permission on a release form. (Often it's not as hard as you might think it would be.)

Message Repeater Point-of-purchase advertisers can have a field day with this one. It so happens that one manufacturer markets a tape recorder under the trade name "Message Repeater." That's not what's being discussed at the moment. Right now we're talking about using *any* tape recorder to repeat a message continually, intermittently, or periodically.

By using electric eyes, special switches or timing devices you can make refrigerators, display cases, packages or cut-out figures "talk" to customers when they open a door, take down a package or step on a mat. For holidays or special events you can prepare tapes with musical selections interspersed with commercials and play them in stores, reception rooms, exhibit areas, etc.

You can prepare these tapes yourself, have them done commercially or buy them from tape libraries. Machines are available which utilize a continuous loop of tape and play constantly until someone turns them off. Others play for varying time periods up to two hours and then have to be stopped, rewound and started again.

Message repeating uses for tape recorders are limited only by the user's imagination. No attempt is made here to exhaust, even remotely, the possibilities.

News Releases This is one way to get your radio news copy aired *exactly* the way you write it—if the station accepts it as news. If not, you could always cut the length and have it aired as a straight commercial.

Unless your ad staff comes equipped with a built-in Orson Wells (or unless you go to the expense of hiring a professional announcer) your batting average on this score will probably be relatively low with stations in large metropolitan areas. To be honest, your chances of a pick up increase directly with a decrease in station size.

This is in no sense a derogation of small stations, be they

in large, medium or small towns. It is only an acknowledgment of understandable fact. Large stations have a large staff—practically to the point of having an announcer in reserve for their reserve announcers. They don't need a recorded news release to fill out their air time and they'd usually rather have their own staff announcers handle the news—unless, of course, you happen to have a news tape containing the voice of a high-ranking Soviet Marshall endorsing your product because it guarantees everlasting international peace.

Smaller stations, on the other hand, thrive on local personalities—known or unknown. Their staff is usually small and everyone on it overworked already. Recorded news releases of any quality at all stand an excellent chance of being used.

Point of Purchase As implied in the section under "Message Repeater," the use of tape recorders in this area is unlimited. As recorders become smaller in size and cheaper, the potentialities will increase even further. At the moment, manufacturers have developed their recorders to a greater extent than owners have developed ideas for their use in this field.

A recording containing explanatory information about a new product would be particularly effective for use with an animated POP display. This is particularly true during the announcement phase of a campaign because sales clerks wouldn't be too familiar with the product yet, and might overlook some of its salient selling features. *You* know what they are. You could see that they are put on tape and make sure the tape accompanies the display.

Use of recordings to give an audible voice to introductory offers, two-for-one sales, improvements in an already established product, announcements of newly discovered uses for a product, etc., is an excellent technique for attracting a customer's attention. The timing is right, too, because a waiting cash register is nearby.

As previously mentioned, it is possible to set up recorders so that they're unconsciously triggered off by the customer. This adds even more impact.

Presentations of Campaigns Have you ever finished outlining an ad campaign to a client or to your boss, sat down and waited expectantly (or hopefully) for someone to say, "Sounds great, go ahead?" Instead, you heard, "Well, *I* like it, but . . . leave your presentation and I'll have the rest of the board read it and we'll let you know."

You're sunk. You know that you sold the man in front of you, primarily because you delivered your pitch in a style worthy of a Barrymore. Now he wants you to leave a written presentation. All the information is there, true, but none of your personal enthusiasm, repetition for emphasis, or the extemporaneous ideas—which *really* sold the proposal—are on those typewritten pages.

They would be on tape, if you'd made a recording of your presentation, either back in your own office or during the actual presentation. Then you could leave the recording and go back to your own office, knowing that whoever listened to it would be influenced by the personality of the man who made the presentation in an enthusiastic voice, using down-to-earth language.

Radio and TV Commercials A tape recorder can be a real work horse when applied to the task of preparing radio and TV commercials. It can be used both for preliminary work and in the preparation of finished commercials.

In preparing finished commercials the tape recorder adds an element of flexibility often required, but seldom available. A recent survey made by an advertising trade publication revealed that tape recordings are widely accepted by radio stations as commercial copy.

In some quarters, tape recordings have replaced transcription discs as the medium for radio commercials and audio copy for TV. One big advantage of tapes is that they can be edited to include different copy for each market. This permits tie-ins with special events, economical copy tests, price changes, use of colloquial expressions common only to given markets, etc.

Tape recordings can also be used to give instructions to local announcers who are to present commercials "live." No matter what symbols are used, it is frequently difficult to insure just the right emphasis for your copy—but an inexpensive tape recording can turn the trick with a minimum of difficulty.

A recorder also makes it easy for you to find out whether or not the priceless prose you've put on paper "listens good" when someone reads it. Copy which looks beautiful on paper does *not* always sound effective when an announcer delivers it into a mike. Testing it yourself before you send it to a station is one way of discovering this before your money (and pride) floats uncomfortably through the ether. If you don't like what you hear on tape, you can always erase it, tear up your copy and start over.

**Reference Data of a
Technical Nature**

How can a literary genius be expected to coin semantic pearls about complicated electro-mechanical "gizmos" which make as much sense to him as a deep-freeze would to an Eskimo? The answer is simple; he's paid to write copy—*all* kinds. And write copy he does, frequently in great pain and anguish.

A tape recorder could all but eliminate the pain—and result in more solid, effective copy. It is becoming a common practice for ad managers, account executives, copywriters, salesmen and others to take a tape recorder into the sacrosanct confines of an engineering department or the cacophonous corridors of the "shop," push a mike in the face of one of the "technical men" and say, "Talk!"

The resulting "talk" is the basis for the nomenclature, terminology, slant and content of solid selling ad campaigns that make sense to the intended—and technically savvy—sales target.

The advantages of a tape recorder are again obvious; the technical advisor does his job just once; he doesn't have to spend valuable time repeating explanations because the listener can play the tape repeatedly until once-muddy technical gibberish suddenly becomes lucidly clear descriptive analysis. Listening to a tape while visually and manually inspecting the

mechanical items being described helps the copy writer get a thorough grasp of his subject.

Storyboards If you have—or ever might—submit storyboards involving musical effects, whistling cracker boxes or symphonic soap, and your name isn't Crosby, Como or Sinatra, you're a logical suspect for a tape recorder salesman.

Nothing can ruin a good presentation faster than a tone deaf basso trying to whistle, hum or yodel the lyrics and melody of music which is essential to getting the full impact from storyboards. A good way to dress up a presentation—if it involves singing commercials or other musical effects—is to have a professional musician record what is needed on a tape which can be played during the actual presentation.

When used with well-prepared storyboards, tape recorded sound effects not only make the presentation more polished, but frequently provide the finishing touch of "realism" which closes the sale.

Testimonials To keep up with the Joneses, you have to know what the Joneses have. When they talk, you listen, and then go out and buy the same thing—only bigger, better and in a different color. That's why testimonials are so effective. And here is another place where a tape recorder steals the spotlight.

There are two main advantages to tape recording testimonials. First, the recorder itself is easy to transport from place to place; and, secondly, it's easy to eliminate any undesirable testimonials—a pair of scissors will do the trick.

Unless you use an extremely inferior recorder, the testimonials you get on tape will be of sufficient broadcast quality to use on radio or TV. They can also be used with slide-film presentations or in voice-over motion picture narration.

Trade Show Exhibits At a trade show a tape recorder can be used as an integral part of an exhibit or it can be used to record material which can later be used in advertising and sales.

As part of the exhibit, a recording can be used to explain some interesting or complicated facts about your product. It can be used to give a product "vocal animation"—like making a refrigerator "talk" to a prospect when the door is opened. It can be used to add sound to movies, strip films or shadow boxes containing color transparencies.

It can also be used as a stenographer or file clerk. When a busy salesman wants to make an explanatory note about a customer, a prospect or a competitor, he can put it on tape much more quickly than he can write a detailed description. When he plays the tape after the show, he gets an accurate and detailed résumé of the important events he didn't want to forget.

Of course, the recorder can also be used for interviews and testimonials from any satisfied customers who stopped at your booth to give you or your product a pat on the back.

RETAIL BUSINESSES

While the tape recorder performs somewhat in the role of an "equalizer" in business—being a medium which is equally important to large national business and to the one-man, small-town retail establishment—in relative importance it is perhaps the most valuable to the retailer.

Most of the applications of a tape recorder in "big business" can, with a limited degree of ingenuity, be applied on the retail level. But, for the retailer, there are many additional uses.

One of the magics of the tape recorder is that it is a tool of both the professional and the amateur. You can, of course, buy the best console-model recorders, install them in costly studios, and hire a crew of professional recording technicians to operate them. But recordings of highly acceptable quality can be turned out on low-cost machines, anywhere at any time, with the same person both "twisting the knobs" and doing the talking.

Retailers require instruments of versatility—and when it comes to putting a "voice" to their promotion programs, the tape recorder is the answer. The same, single machine can

serve a multitude of purposes. It can be a recorder at one moment . . . and a public address system the next. It can fill the store with Christmas music in December . . . and announce summer specials in July.

As in other phases of business, applications of tape recorders depend primarily upon the ingenuity of the retailer. Today, with the growing trend toward self-service merchandising, retailers are constantly coming up with new applications—many of them designed to fill the gap left by the departing sales clerks.

Following is a list of “starting points”—a few already-tried-and-tested ideas which will suggest other methods for putting the tape recorder to use in a retail business.

Recorded In-Store Commercials Retailers who have tried using tape recorded “commercials” to promote special products report unanimously that this method is a sure-fire sales booster.

Many stores intersperse commercials with background music which is played through loudspeakers set up to “fill” the store with sound. Using continuous loop tape cartridges, it is possible just to turn the recorder on when the store is opened, shut it off when the doors close for the night and let it run unattended throughout the day. If continuous loop cartridges are not handy, it takes only one to three minutes to rewind an hour or half-hour tape and start it playing again.

The sound need not be loud enough to bother customers—just loud enough to be clearly audible and understandable. In most cases, the most important factor is the proper location of the speakers. Most recorders are set up so they can be connected either directly to external speakers or to a regular public address system. If the store is small enough, all that is required is the internal speaker of the recorder itself.

In many cases the commercials need not be “broadcast” throughout the entire store. One of the most effective point-of-sale advertising techniques is to “hide” a tape recorder or playback device within a merchandise display. It can run continu-

ously or be activated by such devices as photo-electric cells, floor pads, etc.

Such messages as, "Here are those extra sweet and juicy California (or Florida) oranges you saw advertised at 25c a dozen . . . better take home a bagful," will prove a traffic stopper and a real sales booster.

Radio Commercials Many retailers have found that their best method for radio advertising is to give it a "personal" touch by delivering the commercials themselves.

Trips to the radio station are usually almost impossible for a busy retailer—particularly if frequent copy changes are required. The tape recorder is, of course, the answer. By including background noises the commercials take on a realistic touch seldom achieved in a sound-proofed radio studio.

Other retailers, with a natural flair for radio, produce complete shows within their stores. Some conduct interviews with customers—and get very believable testimonials about the products or services. Others favor disc jockey type shows. In most cases, the records are played directly from studio turntables, with "talk," from tape recordings, added at the appropriate spots.

The "Invisible Salesman" In many instances the tape recorder is an extremely effective "fill-in" for an absent salesman. Many times it can actually do a better selling job than a live clerk. This is especially true when somewhat technical explanations are required or "heavy sell" is necessary.

Recordings can be used by themselves—the customer pushes a button or activates some other control mechanism—or they can supplement a live salesman's efforts by giving him "professional" support to help convince reluctant prospects. They can also be used to make the most of otherwise idle time—such as to deliver a sales message to motorists at a gasoline station while the attendant is busy filling the gas tank, cleaning windows and checking the oil.

Semi-automatic Fulfillment Retailers wishing to capitalize on after-closing sales are picking up additional revenue by installing coin-operated tape recorders.

When the store closes for the evening the coin-operated recorder is set up in the doorway. Evening window-shoppers are invited—by strategically placed posters—to place their order for any articles they see in the window display, by recording their desires on the machine in the doorway.

The following morning the retailer fills the orders on the tape and sends the merchandise to each customer—along with the coin deposit used to operate the recorder. The reason most retailers use a coin-operated recorder is that it discourages pranksters from “playing” with the machine and filling the tape with fictitious “orders.”

Customer Reaction In Hartford, Conn., a retail appliance dealer was curious to know what his customers were thinking as they browsed through his store. He reasoned that frank, off-the-cuff comments from the customers would help him accurately select the type and quality of merchandise they wanted.

To get this information he installed concealed recorders at key locations. The recorders caught the comments made by customers and prospects as they inspected the various pieces of merchandise. By analyzing the comments over a period of time, realistic—and profit-making—decisions could be made as to what items should be carried at all times.

There are countless other applications of tape recorders in the broad field of “Marketing.” It would be impossible to list them all because many of them are unique to a particular operation—large or small. The perceptive reader undoubtedly realized this—many pages ago. By now he probably has a mental or tape recorded list of specific ideas that occurred to him while he was reading. It is hoped that such is the case.

CHAPTER 7

EMPLOYEE TRAINING

ONE OF THE biggest problems facing any business organization is training new employees and keeping veteran workers abreast of new developments. When all personnel are working in a single plant, office or store the problem is not nearly as acute as when they are operating in areas remote from the home office. In both cases, however, to be effective a training program must be timely and comprehensive.

Tape recordings fit well into any training program whether it is local or national in scope. Except in unusual instances they are easier to prepare than other types of training aids which could get the same results. And the "personalization" it contains makes a tape recording more palatable and easier for the listener to comprehend than written data, messages or instructions.

Because of these facts, not only are both large and small companies using tape recordings in their training programs, but many companies are using recordings as the focal point in their overall program. Also, companies which had no formal training programs at all, because they felt they couldn't afford the time and expense involved, now have them—on tape.

Examples of the kind of training particularly adaptable to tape are described on the next few pages.

Memorized, Uniform Sales Presentations

All agents of a large midwestern insurance company are required to use identical sales presentations. The presentations are prepared in the home office in Chicago and they cover every conceivable selling situation an agent will meet. Questions, answers and principles of strategy are recorded on tape and mailed to every one of the company's branch offices. At regular intervals the branch managers assemble all the salesmen under their jurisdiction and play the tapes.

Libraries of Successful Sales Talks

The same company maintains an extensive and growing library of "motivational" talks by respected authorities in all phases of sales. Whenever a new recording of this type is made, 90 copies are dubbed immediately and one tape is sent to each of the company's branch offices. They are retained for a stipulated period and then returned to the home office to be erased and used for the next "message."

Frequently field personnel want to keep the recording. In this case they merely pay the home office the price of the tape. The company reports that these tapes are highly effective in indoctrinating new employees in the fundamental principles of good selling.

Sales Meetings

The Mytinger & Casselberry Company of Los Angeles has 19,000 distributors selling its product—a food supplement—throughout the country. Keeping this many individuals up to date on product development, sales techniques and company policy, is a major problem. They solve the problem with tape recordings.

The company does its own recording in a well-equipped audio-visual department in its main office. There are 350 top agents located throughout the country. Each agent receives one copy of every recording the company makes. The agents,

in turn, channel the information to members of their immediate organization.

Instead of transporting branch managers to a Los Angeles sales meeting, the company transports sales meetings to the managers, by sending tapes through the mail. The savings in travel expenses are substantial. The tapes contain exactly what you would expect to hear at a general sales conference—a general pep talk, facts and figures on national and local sales results and case histories of particularly successful salesmen.

By using this method, Mytinger & Casselberry increases the overall attendance at any given sales meeting; not only do branch managers hear the word “straight from the Head House,” but so do all of the agents working for each manager.

The same method is used to communicate general information to the field. When specific problems arise, questions are discussed and answered on tape. If the problems are national in scope the tapes are sent to all 350 key men. If the home office notices problems in a certain area, tapes are sent only to those involved.

Live Training Sessions Particularly successful meetings don’t “just happen.” There are concrete reasons why they were so successful. The reasons are usually: 1) painstaking and thorough advance preparation; and, 2) outstanding performances on the part of those who conduct the meeting. It is an absolute waste to use this winning combination of factors one time only.

A tape recording of an outstandingly successful meeting—whether it be a sales meeting, a personnel training session, or a technical discussion—constitutes a capital asset. It can be played repeatedly for future audiences, thereby getting increased mileage out of the time and money put into the original meeting. And, also of significance—the audience can be one person or a hundred persons.

This technique is extremely valuable in technical training involving complicated equipment or operations. If a tape recording is made when a competent instructor shows a new employee how to operate a complex piece of equipment, a

considerable amount of time will be saved for both individuals. The instructor won't have to repeat explanations so often. And the trainee won't have to lose time trying to remember what was said; he can play back the tape as many times as necessary.

Talk-And-Do Training This technique is particularly effective in training mechanics to install, service and repair machines and equipment. It is ideal for use by companies who own and operate identical pieces of equipment in a number of widely scattered plants or branch offices.

The principle is extremely simple. A mechanic, who is an expert on the particular piece of equipment, tells what he is doing *as* he does it. He times his comments to match his movements so that they can be duplicated, step-by-step, by anyone who listens to the recording.

For example, if instruction is being given on setting up a piece of new machinery, the tape might sound something like this: "The first thing to do is remove the cover plate from the gear box." There is then a pause, just long enough for the listener to locate the gear box. "Before you do, though, be sure the safety bar is pushed up in the neutral position." Another slight pause. "Now, remove the bottom left screw first, so that the plate won't fall in and get caught between the motor shaft and the fan blades."

When this kind of recording is played by a competent mechanic who is already familiar with machines of the same general type, he can physically follow every move made and described by the instructor. When only a few men in the home office have been trained on a piece of new equipment, a talk-and-do tape can save the expense and time involved in sending them into the field to train mechanics in branch organizations.

Self-evaluation Speech plays an all-important part in every phase of business activity. The use of a tape recorder to improve one's speaking ability can benefit both the top executive and the man who sells behind a counter.

There is no better preparation for any type of public speak-

ing than making a tape recording and then playing it back for self-analysis. Speech defects can be easily detected and corrected. Inflection and emphasis can be changed or modified for additional impact. Pronunciations can be checked.

The same principle applies to a "pat" sales pitch. The main danger in using a memorized sales talk is that it frequently *sounds* memorized—lifeless. Delivering the presentation to a tape recorder provides an excellent opportunity for immediate evaluation of how your voice sounds to others.

Along these lines, some companies have adopted the practice of using this technique for training new salesmen. Two men are involved, one being the customer and the other the salesman. The customer makes things as difficult as possible for the salesman, using every possible excuse for not buying what is being offered. When the tape is played back the new salesman has a chance to hear how well he met and overcame objections or where he faltered in the face of opposition.

Orientation of New Employees Many companies hold orientation lectures for

all new employees. The primary purpose is to acquaint them with company history and general facts of operational policy. Putting some of this material on tape can be of benefit to both the company and the new employee: the person who would normally give the lectures can remain on his regular job and the new employees can listen to the recordings at any time which fits into their schedule.

This method insures that everyone hears the same facts, presented the same way. There are no problems of a disinterested lecturer who only hits the high spots because he feels tired or because the audience doesn't happen to inspire him at the moment. Likewise, the company doesn't have to worry about any deviations from the "party line," due to the extrovert who manages to ad lib a 10-minute lecture into a half-hour extravaganza.

Here's a typical case of a tape recorder used for employee orientation. Abbott Laboratories, the pharmaceutical products manufacturer of North Chicago, Ill., solved a difficult new em-

ployee briefing problem by using a slide projector—tape recorder combination.

Abbott is in a position similar to quite a few firms which sell to someone other than the “end consumer.” The company’s advertising is directed at doctors, hospitals and druggists and is seldom seen by the layman. Consequently, new personnel usually know little or nothing about the company, its products and its industry status. Because of the broad scope of the Abbott operations, plant tours couldn’t be counted on for orientation purposes . . . but the company was convinced that a comprehensive orientation program would be mutually valuable to employees and itself.

The answer was an audio-visual presentation—a 30-minute, 82-slide “armchair tour” of the organization, with the commentary on tape. The slide-lecture was designed to show what the company is and does, and simultaneously demonstrate the importance of the company’s products. It also illustrates the benefits of working for Abbott and puts across the need for conscientious, careful work on the part of each employee.

Training tapes are also extremely valuable for veteran employees—as refresher training. If the sessions are technical in nature, the veteran employee can refresh his memory about some points he’s forgotten or on which he never was quite clear. If it is a sales training session, the listener hears once again the “school solution” to particular problems, counter arguments, etc.

One obvious advantage to training tapes is the fact that they can easily be sent to “branch” locations—where over-all company training is frequently by-passed or completely overlooked. With tape recordings, *all* employees can receive identical training.

Personal Evaluation This is quite similar to “self-evaluation” discussed previously. Here, however, the evaluation might be made by someone other than the individual who made the recording.

A large Chicago company has a nation-wide network of salesmen selling the company’s services throughout the country.

Many of the agents have never had previous sales experience of any kind. The independent salesmen work out of centrally located branch offices, each of which has been supplied with a company-owned tape recorder. Upon joining the company each man is informed of the company's comprehensive job-assistance program. One facet of the program is the evaluation of individual selling techniques.

New salesmen record themselves giving a sales presentation. It may be one that is totally unsuccessful or one that is effective, but not outstandingly so. The recording may either be a simulated encounter or an actual sales attempt with a prospect who didn't buy.

The first type of recording is done either in the branch office or the salesman's own home, using the office machine. For recording the actual sales attempt the home office sends the salesman a miniature recorder which may be used without the customer's knowledge. The recordings are returned to the home office where they are evaluated in detail by various experts in different departments. Factors checked include: organization of the presentation; speech peculiarities; vocabulary; style of delivery, etc. The analysis covers both good and bad features and explains "why" in all cases. When the analysis is completed it is recorded and sent back to the individual involved.

Telephone Solicitations Organizations which use telephones for sales solicitation have found tape recorders particularly valuable in correcting bad habits individual solicitors may have developed.

After sitting at a phone day after day and using a standardized "pitch," there is a natural tendency for the solicitor to fall into a delivery or speech pattern which sounds just the way he feels—bored. When he hears himself on tape, followed immediately by someone who points out specific factors that are good, bad or indifferent, it is much easier for a solicitor to recognize the necessity for corrective action.

This same system also is effective for improving the performance of receptionists and switchboard operators.

Actually, the tape recorder can become a valuable part of any training program—as a replacement for other types of audio presentations used previously or as a completely new element. What gives the tape recorder a distinct advantage is the fact that the same instrument which can be used for so many purposes can be applied to the training program, eliminating the need for expensive equipment which may be used but infrequently, and which requires the services of some specially trained person to operate it.

CHAPTER 8

AUDIO AND VISUAL PRESENTATIONS

WHEN YOU stimulate the ear and the eye, *simultaneously*, you have an "audio-visual" presentation. The term "audio *and* visual" is used to describe a presentation designed to appeal *either* to the eye or the ear, but not necessarily simultaneously. For instance, a chart would be a "visual presentation"; a tape recording would be an "audio presentation." A slide or film strip, shown to the accompaniment of sound of some sort, would be an "audio-visual" presentation.

Business and industry are invading deeper and deeper into a province that in past years belonged almost exclusively to academic institutions—audio-visual (and audio *and* visual) "education." For many years American colleges and universities have successfully used the combination of sound and sight for training purposes. Until relatively recently, businessmen seemed to regard this as a technique valuable only in formal education.

The complexities of modern business have changed all this. Take a case in point. The primary purpose of a business "report" is to communicate something. A top level executive needs many different reports on widely varied but related topics to make decisions based on "the big picture." Regardless of his

innate intelligence and intense desire, the fact remains that there is a definite limit on the number of facts anyone can absorb and act on in a given time. Add to this the problem that today's top management *must* concern itself more closely than ever before with the details of significant activities and developments in every department. The sum total of these facts makes it imperative that management have more information—in a form that is easily and rapidly comprehensible.

The swing is toward audio-visual presentations. Various companies have adopted different methods for consolidating important facts into an up-to-date visual or audio-visual presentation that can be reviewed by one individual or a number of persons simultaneously. The Lukens Steel Company created what it called a "Market Facts Board"—an eight by eleven foot panel which holds about 60 charts containing information of interest to its sales management.

The Admiral Corporation in Chicago set aside a special room called the "Sales Intelligence Room." In addition to charts and graphs the room contains chairs and tables for conferences. At regularly scheduled sessions, audio-visual aids are used to brief top company officers on the economic outlook, production, sales and inventory trends.

U. S. Steel's General Sales Committee relies heavily on colored slides in the reports it presents to the company's top management. The reason given is that, because detail is minimized, slides can double the impact of a presentation by combining visual and aural reception of the important highlights of interest to top-echelon executives.

TECHNIQUES

Sound-slide Presentations

Costs and Materials For less than \$20 you can make a full-color, sound-film presentation from 15 minutes to a half hour long! To present the complete show you need only seven items. Here they are:

- 1) Tape recorder and microphone

- 2) Magnetic tape
- 3) 35-mm camera with flash attachment
- 4) Film
- 5) Flash bulbs
- 6) Slidefilm projector
- 7) Screen

Mechanics The process of making such a presentation is extremely simple. First, write a "working script" which describes the pictures needed to tell your story. Next, have the pictures taken—probably one of your own employees can handle a 35-mm camera well enough to do the job, particularly if the presentation is primarily for internal use. Third, select from the finished transparencies the ones which best tell your story and then arrange them in proper sequence. Then set up the tape recorder, projector and screen, and have the narrator or narrators describe what is on the screen.

That's all there is to it. You've got a complete "show," in color, with sound. The 20-dollar figure cited above was based on the cost of the expendable materials involved—tape and film.

Here's a tip on the mechanics of "pacing" your finished presentation. Try to hold presentations to around 20 minutes. Extend it to a half hour only if the subject is of *vital* interest to those who will see and hear it. Plan to keep one picture on the screen *no more* than 15 to 20 seconds unless it is a chart, graph or schematic requiring detailed visual analysis and audio explanation.

Mathematically inclined readers have probably used the figures just quoted to compute the number of pictures needed for a 15 or 20-minute presentation. For those who haven't, it would take approximately 35 to 40 slides for a 15-minute presentation, or 55 to 60 for a 20-minute show. With three 36-exposure rolls of color film, you'll get enough pictures for a major saga.

Any tape recorder can be used in making sound-slide presentations. Some recorders, however, offer various refinements which automatically change the slides in the projector and

synchronize the narration with each slide. These are especially valuable when one person is making a presentation which includes slides on which he wishes to use a pointer to pick out specific elements in the picture. It saves him from having to bring along someone to run the projector while he illustrates, or else sprint back and forth from the projector to the screen.

Typical Applications The reason slide presentations have been given considerable attention is that there are so many jobs they can do so well at such low cost. For example, they can be used to:

- sell products or services

- train salesmen

- teach workers how to operate machinery and equipment

- illustrate the advantages of a new product

- describe new techniques for doing a job

- "animate" statistics

- explain why something was or should be done

- support a particular course of action

- change opinions

- generate attitudes

and countless variations and improvisations implied in each of these uses.

Case Histories— Here is how some companies are using
Public Relations tape recordings in their audio-visual presentations right now.

The Atlas Fish Emulsion Fertilizer Company in San Francisco decided that amateur gardeners needed special cultivation as customers. The company produced a 30-minute packaged lecture consisting of 86 Kodachrome slides with a tape commentary. The lecture, entitled "Tuberous Begonias at Their Best," is available free to garden clubs who guarantee a minimum attendance of 50 people. The clubs provide the slide projector, screen and tape recorder—and after seeing the presentation, customers for Atlas.

The Alexander Film Company in Colorado Springs keeps its doors open to visitors who want to see the plant. Because of

the number of people involved (an estimated 8,000 every summer) there was a problem of greeting visitors and getting them organized the minute they entered the reception room. The problem was solved through the use of a life-size photo of the company president and a concealed tape recorder using a continuous tape.

The picture "talks" (in the president's voice) to all visitors, welcoming them and providing a brief introduction to the organization. This keeps the visitors busy until a guide takes over to begin the tour.

Case Histories— Other companies have carried the Alexander program one step further; they substitute tape recorders for plant guides.

Recorders using continuous tapes are located at strategic points throughout the plant. They are turned on and off either by means of a switch concealed in a floor mat or an electric eye. As visitors enter the plant a tape recording greets them, briefly outlines what they will see and then gives them directions to get to the first stop.

At every point on the tour a recorder explains to the visitor what he is seeing and then finishes by directing him to the next location. Self-conducted tours save money for the company and time for the visitor. There's no waiting for scheduled tours. Visitors can start a tour whenever they arrive.

Case Histories— An exhibit that explains itself is much more effective than one that is static. At conventions, sales displays, in company "museums," or in the plant itself, tape recorded narrations are being used effectively to explain what the exhibit is, what it does, how and why. Talking exhibits, in addition to being a "stopper," release salesmen or booth attendants to write orders and talk to customers or prospects.

Point-of-Purchase Advertising This was mentioned earlier in the book, but it bears repetition. The impact of any good visual advertisement can

be increased by the use of sound to direct a customer's attention to it.

Sample Sales Presentations Recordings of a star salesman making his pitch, used in conjunction with easels, flannel boards, flip flops, etc., are an ideal and economical method of training other salesmen, dealers and demonstrators spread throughout the country.

Do-It-Yourself Instructions Manufacturers of machinery which is assembled by the purchaser have found that tape recorded assembly instructions are sometimes more effective and easy to comprehend than the standard, written instructions.

A modification of this method is being used by plants faced with the problem of introducing new products over wide areas in a short time. Explanatory tape recordings are made to accompany complicated diagrams, illustrations or charts sent to company representatives in the field.

Motion Picture Presentations

Problems An economical way to put sound on film is to use a tape recorder. There is a definite problem in keeping the sound synchronized with the pictures, but in many cases this problem is overcome by careful script writing. Frankly, the finished pictures, regardless of the skill of the recordist and the script writer, will probably not be "Hollywood-quality" films. They can be, however, more than adequate for training or sales purposes. Producing films of this quality is not easy, but it can be done.

Mechanics Using a stopwatch, *accurately* time the length of each scene in the finished picture. Prepare a sequence outline containing a short description of each scene's content and make a note of the length after each written description. When writing the narration, make each section of narration a *minimum* of one second shorter than the scene it

accompanies. Try to avoid "narration to action"—i.e., describing each step of an operation at the exact time it takes place on the screen. When the script is finished, project the picture and make the recording as you watch the screen.

Unless the recorder—even an expensive one—is specially constructed or adapted for motion picture narration, it may vary as much as 10 or 15 seconds in a 30 minute recording. This can be disastrous. A 30 minute film will clock *exactly* 30 minutes every time it is projected. The problem is obvious.

There are three ways the problem of synchronization can be solved without resorting to a "loose script": use of a synchronizing attachment on the recorder; use of a specially-designed recorder; and, use of a motion picture *projector* which has a built-in facility for magnetic recording.

Of the three, the first method is the least expensive. Methods two and three are recommended if the film is to be used for external sales or public relations purposes. If the production is for your own employees it is much more economical to use the system described in detail, above. With care and a little practice you should be able to do a highly satisfactory job on all but the most complicated film.

CHAPTER 9

GENERAL BUSINESS USES

IN ADDITION to the previously-discussed broad categories of uses for tape recorders, there is no end to other applications. This is true because in many instances a particular business is "a law unto itself." Only the individual who personally conducts that business can be fully aware of its specific problems, challenges and opportunities.

When organizing the material to be included in this book the authors faced the practical necessity of arbitrarily including certain uses in the various basic classifications. It was recognized that there are many instances of overlapping usages and closely interrelated applications. However, for purposes of clarity it was still essential that certain techniques be assigned to a specific category. To do this it was necessary to omit from the individual chapters, specific examples that were of a borderline or fringe nature.

But in this chapter you will find a number of miscellaneous, generally unrelated uses which have already been proved in practice. It is this very fact—the success and effectiveness of the various applications—which demanded their inclusion in the book.

Once again, the list that follows is not offered as the *total*

of all conceivable—or even all *known*—uses. Instead, it includes only what the writers consider the more significant, idea-stimulating applications and case histories. As with the other chapters in this book, the pages that follow should be used and considered as an “idea springboard.”

Authors Many writers use tape recorders to “talk” rather than write their manuscripts. Much of the work on this book, for instance, was produced in just this manner.

One of the major advantages of this method is that you can talk faster—much faster—than you can write. This means that ideas can be recorded while they’re “hot.” And, it’s quite natural to keep your thoughts on the subject while you’re talking—which is not necessarily the case when your hands get into the act for writing or typing.

The case of this book gives further evidence to the value of the use of a tape recorder for writers. Except for brief intervals the co-authors were physically separated by many miles—from California to Illinois. By using tape recordings, however, it was relatively simple to “get together” in collaboration on material. In addition, “outside experts” contributed much valuable assistance—*on tape*. If, however, the sharing of ideas had required lengthy written letters—or expensive cross-country travel—it would have been almost impossible to produce the manuscript.

Overcoming the obstacles of physical distances is by no means the only advantage a tape recorder brings to the author. In writing the life story of a famous actress for a popular national weekly magazine, a well-known feature writer relied heavily on tape recordings for the gathering of his data. The actress is a notoriously busy and active person. It was virtually impossible to find a time when she could drop all other activities to stay in one place for several lengthy interviews. Part of the problems were solved when the author drafted a comprehensive list of questions and delivered them *and a tape recorder* to the actress’ apartment. In a relatively short period of time, and at her own convenience, she was able to record the information needed by the author. In this particular in-

stance, literally *miles* of recording tape were used in assembling the finished story, because countless friends and acquaintances of the actress were similarly "interviewed" to provide background and "atmosphere" material.

Writers have also made particularly good use of tape recorders installed in their car. Several leading free lance writers who travel regularly to get their story material have learned to dictate their articles as they drive between assignments. This constitutes the first draft and revisions are made as the material is played back whenever the writer gets to his typewriter. Some of the top business writers report that they have become so adept at this technique that they just send the tapes to a secretary who transcribes the story and sends it off to the editor.

One big advantage to this method of preparing material is that you can get at it while it is completely fresh in your mind. No need to search through piles of notes to try to bring back a thought that would have been quickly remembered an hour or two after an interview, but which gets lost in a haze of thoughts as time runs on.

One writer records all interviews—including his thoughts on presentation of the article—on the spot. He then listens to these tapes two or three times, inserts a fresh tape in the recorder and begins dictating his story.

Another journalist—who travels over 50,000 miles each year, preparing articles for top consumer and business publications—keeps his recorder humming almost constantly. When he calls on a story source, his tape recorder goes along. He records the entire interview and plays it back so that the person being interviewed can check all the facts for accuracy. This eliminates the possibility of any subsequent claims of misrepresentation or inaccuracies in quotations.

This writer has his car's power converted for 110-volt operation. He plugs in the recorder as soon as he gets back into the car to drive to the next story location. He first plays back the interview to make sure that all of the facts are clearly in mind. Then he switches the recorder over to "record" and

starts dictating his story as he drives along—with the microphone on the seat beside him. The end result is the first draft of the story, which he sends to his secretary for transcription.

While it may take a short while to become accustomed to such a method of "writing," those who are using it report that it soon becomes second nature and that the recorded "first draft" most frequently is the final one and can go off to the publisher as soon as it is typed. The net result of this technique is twofold: far greater productivity and better articles because of the "freshness" of all material.

Farming It's a far cry from the days of the hand plow, but farmers are almost daily learning more applications for tape recorders. Valuable crops, for example, can be protected with scarecrows wired for sound—sudden shouts, whoops and hollers keeping crop-eating birds and other animals at bay.

A leading turkey breeder, who must select the best turkeys from his stock for market, uses a tape recorder to record the characteristics of each bird. Birds are wing banded for identification. Field crews then go over the birds, judging them and dictating their comments into a tape recorder instead of to another man who formerly would write down the remarks.

Another example of the ingenuity of the farmer with a tape recorder is in hog production. During the night an automatic device turns on the lights and awakens the hogs by recorded grunts of fellow hogs at a feeding trough. The power of suggestion, plus—possibly—a tinge of the competitive spirit is just too much for any self-respecting hog to withstand, even one in a somnolent state. As any hog knows, when fellow porkers are feasting, it's no time to stay in the hay; the only sensible thing to do is to join—and out-eat—any companion gourmets before they make pigs of themselves. The end result is that the unsuspecting hogs eat more and oftener. By hastening their journey to a frying pan they fatten the wallet of their owner.

Although this didn't happen on a farm it does involve ani-

mals—birds—and consequently seems appropriate for inclusion at this point.

A short time ago the city officials and residents of the District of Columbia became quite upset about the uninhibited—and somewhat messy—deportment of vast numbers of starlings who had immigrated to D.C. The birds were making their home—and other things—all over the District Building, located at a heavily trafficked intersection in downtown Washington. Commuters waiting on the sidewalk below frequently suffered almost as much as the building. It was definitely a messy affair. All attempts to evict the starlings by conventional methods were unsuccessful. A bird lover came to the rescue, by disclosing a startling fact; starlings could not endure the sounds of other starlings shrieking in fear. A recording of frightened starlings was made immediately. The results were immediate and gratifying. When the recording was played the previously-unevitable, feathered tenants made a hasty departure—and didn't return.

Mood Music Providing background music in offices, industrial plants, restaurants, etc., is simple and extremely economical through the use of a tape recorder. Since the average recorder is already its own public address system, it is merely a matter of connecting the recorder to extension speakers—or for extensive installations, to the regular P.A. system. Music pre-recorded on tape is now readily available at a reasonable cost.

A photography store in Elgin, Ill., uses tape recordings for a double-barreled purpose—to create a pleasant atmosphere in the store and to advertise the tape recorders offered for sale.

Once or twice a week the owner takes a recorder home and records popular records played on his phonograph. The recorder is taken back to the store the next day, placed on a prominent counter and played continually throughout the day. The volume is kept low enough so that it doesn't constitute an annoying distraction to customers and clerks, but high

enough to attract attention. This same technique is being used by many larger organizations to provide music in lunch-rooms, reception offices, etc.

In Arlington, Virginia, a drive-in restaurant uses tape recorded music to entertain customers in their cars. The drive-in has combination speaker-transmitters—similar in appearance to the speakers found at outdoor movie theatres—which car customers use to place their orders. Music from the tape recorder is played through the speakers continually, except when the customer pushes a button to transmit his order to the kitchen.

At-home Work The standardization of tape recorders has proved a big assist to the at-home work field. Housewives who were once secretaries are now transcribing tape recorded dictation in their homes for businessmen who don't have their own secretaries or need additional help.

While regular dictation machines can, of course, be used, there has always been the problem of lack of standardization of such equipment. Thus, it formerly was necessary to locate an at-home worker who had matching equipment to the dictation machine. In addition, few housewives were in the position to purchase a single-use machine for this purpose alone—particularly at prices that frequently ran from two to five times the cost of a versatile tape recorder.

Library Research The problem of making extensive notes in libraries has long been a headache for many researchers. Dictating desired material into a tape recorder simplifies the matter greatly. Almost all libraries have facilities where material can be recorded without disturbing readers.

Use of a tape recorder for library research has two main advantages—speed and simplicity. Both advantages result in better note-taking. For even the professional researcher there is a tendency toward over-abbreviation of data, both in the notes actually made and in the words put on paper. To save time and effort the natural impulse is to omit as much writing

as possible, and commit "to memory" as much as possible. Trouble begins when the researcher leaves the library and returns to his desk. His memory stubbornly refuses to commit what it should and the hieroglyphics on paper don't lend themselves to ready translation.

Tape recorders eliminate both problems. Quotes can be read directly from the text. Because this is so fast and easy, the researcher isn't faced with the problem of verbally abbreviating "Constantinople" into "Cnstpl"—as he probably would have done on paper, much to his later regret. As a result, the notes on tape are complete, accurate and comprehensible.

Assembly Instructions Machinery that must be assembled by the purchaser is often sent out in kit form, with assembly instructions on a tape recording. This can be particularly important in the case of equipment which has custom-built features—because it tends to eliminate the unintentional damage which might result when someone who is familiar with similar but not *identical* equipment attempts to use conventional assembly procedures. Individuals whose past experience makes them feel infallibly competent to assemble, operate or repair any equipment generally used in their particular field, are more likely to review tape recorded instructions than they are to read an instruction manual or letter.

Tape-recorded instructions of a technical or mechanical nature can by no means be considered as an all-inclusive replacement for standard technical or service manuals on complicated machinery and equipment. Schematics and wiring diagrams, for instance, don't lend themselves to tape reproduction on today's standard recorders. But, tape still has a valuable place as a supplement to a comprehensive, costly printed manual. When minor changes or modifications are made in a basic machine, changes in instructions can be handled and transmitted simply and economically on tape. A number of large machinery and equipment manufacturers are using this method today, to save the cost of reprinting and revising costly manuals when changes are of a minor nature.

Time and Motion Studies Tape recorders have proven themselves well in this field. They have even resulted in some basic changes used to make a study. Instead of simultaneously trying to observe, clock individual operations and take notes, the observer merely keeps his eyes on the subject at all times and describes every detail to the tape recorder.

Back in the laboratory a stop watch is used while the recording is played as many or as few times as necessary to get an absolutely accurate timing of each operation described on tape.

Those who have adopted this system report that after becoming familiar with the new method, studies can be made faster than by the old system. Less time is needed for the observation phase. After watching the complete operation enough times to become familiar with all the details, the observer makes his recording. This reduces the time consumed waiting for repetitive cycles so that successive operations can be described on paper and then accurately timed with the stop watch.

Laboratory Research The same techniques are important in laboratory and engineering research. Frequently the use of the hands is required throughout the entire course of an experiment. Unless an additional person is on hand throughout the experiment, to take notes at the precise instant important events occur, the researcher must attempt to remember everything that happened and write down the complete details immediately after the experiment ends. Dictating a step-by-step account of the proceedings to a tape recorder solves the problem.

Internal Eavesdropping The strategic placement of hidden tape recorders throughout offices or factories allows employers to eavesdrop on candid and frank statements of employees.

Used in the proper spirit, this technique can prove mutually beneficial to both employer and employee. Wrongly used, it

can disrupt an entire organization by shattering employee morale and breeding an atmosphere of suspicion and distrust.

Regardless of how hard he tries no employer will permanently be able to conceal from his employees the fact that hidden recorders are in use in the plant. If the candid information obtained from the hidden recorders is used to the overall benefit of the organization and everyone in it, the employer is using this technique wisely. If the recordings are used as "evidence" to "trap" a disgruntled employee the employer is inviting personnel problems in king size packages. A disgruntled employee and a disloyal employee are by no means necessarily the same. The disgruntled employee may feel as he does because of a management policy which needs changing. An astute employer might well profit considerably by taking remedial action on the *comments* of a disgruntled employee, instead of on the employee himself.

If hidden recorders are to be used for cloak and dagger investigative purposes, it would be well to check with legal counsel before using the recordings officially—and sometimes unofficially—as the basis for disciplinary action. Professional troublemakers are usually quite conversant with "the law," and will take full advantage of possible loopholes which could conceivably turn the tables on you.

Internal News Reporting A large manufacturing company uses a combination of the telephone and a tape recorder to disseminate important news to employees.

Messages are recorded on tape and played into the main plant telephone system. To hear the message, the employee dials a special number on his office or shop phone. Thirty calls can be handled simultaneously and an automatic counter records each call. The company has found this method of "passing the word" to be extremely effective internal public relations.

A modification of this technique is to use existing P.A. facilities for "scheduled broadcasts." During rest periods, change of shifts, lunch periods, etc., internal and external news is broad-

cast throughout the plant. An advantage of this system is that an item considered to be of vital importance can be transmitted to all employees simultaneously. Material can be prepared in advance and recorded on tape for release at a future, specified time.

Repeated Phone Messages One of the first applications of magnetic recording — repeated phone messages—is still one of the most popular uses of a tape recorder, with many variations being used today. The most common, of course, is to offer time and weather information when a special number is dialed. Newspapers who offer special sports information, likewise, record scores of ball games on tape and this information is played automatically to those who dial a special number.

One of the most clever adaptations of this technique was the idea of a Washington, D. C., radio station. To announce a new program to radio time buyers in New York advertising agencies, the station sent “secret” messages with a “Mailed in the Pentagon” postmark. The letter inside said that the information was so “hot” that it couldn’t be sent through the mails . . . but that those interested could get all of the details by dialing a special number.

Few could resist the temptation to learn what the “secret” was all about. They dialed the special number. Into their ears poured a special tape recording giving all the details about the new program. Most telephone companies are able to arrange similar set-ups.

Safety Warnings Tape recorders, activated by foot pressure pads or photo electric cells, are being used by an increasing number of business organizations to warn employers of danger zones.

In one plant where highly volatile chemicals are used a tape recorder carries a “no smoking” warning. Chemicals fill the air with invisible odorless gases. Naturally everyone working in the area is aware of the danger and observes the no smoking regulation. However, the automatically triggered tape recorder

serves as a highly effective warning for visitors or employees from other departments who enter the premises and are unaware of the danger.

There is room for humor, even in the grim business of safety warnings. In a plant where manufacturing processes and materials made smoking not disastrous but undesirable from the fire-hazard standpoint, employees had a favorite spot to hide to "sneak a smoke." It was decided that something should be done about the situation. A hidden recorder, automatically triggered, was the answer. Just about the time the unsuspecting employee inhaled his first "drag," a reproachful, injured, disappointed "voice" would say, "Aw, Mac, you know you're not supposed to smoke in here."

Any day now some enterprising personnel manager will carry this one step further, and use it on dilatory workers. Every five minutes a tape recorder in the women's rest room will break out with the song, "Heigh ho, heigh, ho, it's *back* to work we go . . ." or a concealed recorder behind the drinking fountain will periodically sound off, "So, men, there I was, flat on my back at 20,000 feet. *Don't* go back to work yet, let me finish my story. . . ."

Voice Suggestion Box In some factories a tape recorder has been used as an effective substitute for the conventional suggestion box.

Instead of writing out suggestions and dropping them in the box, the employee merely pushes a button which activates a tape recorder and then dictates his suggestion into a microphone. After the first few days, practical jokers and pranksters have relieved themselves of the urge to wisecrack insensible inanities and even unattended, unmonitored recorders are used only for bona fide suggestions.

The quality as well of the quantity of good suggestions usually increases when a recorder is used to replace the regular box. Many employees who either "can't" or "don't like" to write, have excellent ideas concerning the manufacturing, production or administration done in their departments. For real

or imaginary reasons they are convinced that they don't have the training or ability "to write up a suggestion so the boss would understand" what they mean. They *can* put their suggestion in words though—and they're much more likely to offer their suggestions when all they have to do is "push the button and start talking."

Noise Evaluation A tape recording provides an easy method of making noise evaluation studies. An unattended recorder, set at a pre-determined sound level, is placed at a given spot and turned on. It records any and all sounds over a given period. These recordings can then be checked to determine if special soundproofing is needed in a particular area, or if a change in operational methods and techniques is desirable.

Incidentally, used properly this technique of recorder usage can be amazingly effective in other areas of operation than a factory. Recently a New York City landlord finally convinced a judge that a tenant should be evicted. After listening to a meek, mild-mannered man quietly and plaintively deny that he made any loud noises or disturbed the big bully who was his landlord, the judge was about to dismiss the case. The landlord then produced a tape recording of several of his tenant's more "quiet" evenings at home. The recording not only shook the magistrate's faith in human nature, but also the rafters of the courtroom. The Court upheld the eviction order.

Recording Conventions A nationwide insurance company found tape recorders to be the solution to the problem of drastically cutting the travel expenses involved in bringing its field representatives to important conventions. The conventions are brought to the field representatives—all over the country—*on tape*.

As part of its "perpetual training" program the company paid to bring as many of its representatives as the budget would allow to the various important conventions held yearly throughout the country. As the company grew, so did the travel

expenses. Despite a firm belief in the value the conventions had for the individual salesman, the costs of bringing all of its key agents to each convention finally became prohibitive.

On an experimental basis the company sound technician was given the assignment to "cover" a complete convention on tape. All the major speeches were recorded. Many of the panel discussions were also put on tape. When the convention ended the technician edited his tapes into one consolidated package. A three-day convention was telescoped into roughly four hours of tape recording—all four hours of which were solid "meat."

When the tapes were duplicated and sent on a "round robin" basis to the field representatives the results were amazing and the individual reception of the "canned" convention was incredible. The home office received requests from men who wanted to keep the tapes, permanently, even if they had to pay for them.

Today it is possible to employ special companies who make a business of recording conventions, or sound technicians on the company payroll can be given the assignment. Regardless of which method of convention coverage is decided upon, two factors are basic to the ultimate success of the coverage. Strangely enough, they have practically nothing to do with the actual mechanics of recording, although, of course, the tapes must be of sufficient audio fidelity to make speeches intelligible.

The two important factors are: 1) intelligent *editing* of the original tapes; and, 2) effective *distribution* of the edited tapes to company personnel in the field.

Conventions usually last at least two days. A lot of tape can run past the recording head in that time. With due respect to both convention speakers and delegates, *not everything* uttered from the platform or floor can honestly and realistically be classified as priceless pearls of wisdom. The edited tapes should contain absolutely no hint of filibustering or the other inanities that occasionally creep into convention dissertations.

When the edited tapes have been thoroughly expurgated, sufficient copies should be duplicated so that all interested employees can hear them within a reasonable time period. Noth-

ing can get quite so stale as last year's convention heard by the branch office staff in East Dry Gulch *next* year.

Home Dictation Not every businessman has the perspicacity (or the muscle power) to carry a dictating machine home with him *every* night. Unfortunately it is invariably the night he leaves the machine at the office that the answer to a previously insoluble problem or "just the right reply" to a controversial letter pops into mind. By morning, back at the office—and the dictating machine—it's popped out again.

The solution would have been a tape recorder at home—to match the one at the office. Few businessmen can force themselves to sit down and write sudden inspirations on paper after they've been home an hour or two. Even fewer are successful in convincing their wives to "take a letter." But it is a simple matter to turn on the recorder, push the button and start talking. Little time is consumed, almost no effort, and the "hot" idea is permanently captured—while it is still sizzling.

At the office the next morning it is a simple matter for Miss Jones to put the tape on the office recorder, plug in the ear phone and start typing.

Having a tape recorder at home, to match the one at the office, is not nearly as extravagant as it might seem at first thought. In the first place, it will be used for many purposes other than recording dictation . . . important projects such as recording the children, taking programs "off" the radio, or livening up a house party by making secret recordings of unsuspecting guests. (See Chapter 10.) And then, on the more practical side, it probably won't cost you one cent; either the company will pay for it or else it will wind up on your expense account.

Sound Trucks All good politicians can attest to the functional efficacy of a tape recorder installed in a sound truck. While the politician is busy making a personal appearance on a TV or radio show, the sound truck can carry his message—in his own voice—down the streets and into the front yard of every house in "his" district.

The conventional businessman can make good use of tape recordings in sound trucks, too. Retail stores can use these mobile broadcasting systems to advertise storewide "specials," clearance sales and other important events. Enterprising retailers have made arrangements to "sponsor" community events, such as football and baseball games. Naturally one or two "commercials" find their way into the sound track of the general comments emanating from the speaker horns on the truck. The commercials are pre-recorded and given to the owner of the truck, for playing either at stipulated intervals or at the discretion of whoever is handling the microphone inside the truck.

Sound Effects There are times when certain sounds are unique to a product or a process of manufacture. Frequently these sounds can be used quite effectively in radio, television or motion picture advertising. Why go to the expense of having an outside agency come into your shop to get something you can get yourself, on your own tape recorder?

Recently, a company which operates vending machines wanted to include in a training movie it was making, the sound of a coin dropping through the coin mechanism in a vending machine. This sound is unique and would be recognized instantly by anyone who works with vending machines—even if no machine were visible when he heard the sound. The problem was solved merely by taking a tape recorder into the company's repair shop, dropping a coin into the mechanism and recording the results.

Of course, there are times when sound effects can be simulated by artificial devices. In fact, there are actually occasions when they *should* be—because the "real" sounds don't sound authentic. But, if you've got a sound effect that *must* be used "as is" a tape recorder will get it for you nine times out of ten.

Mechanical Performance Evaluation Binaural tape recordings combined with high speed cinematography are being used by a leading automobile manufacturer to make laboratory evaluations of mechanical performance.

The company uses the tape recorder-camera combination to analyze the operating characteristics of valves and valve lifters in its high compression engines. Previous to the use of the recorder-camera combination, trained judgment and visual observation was the only method of determining if valves were operating up to desired standards.

Even with highly competent, experienced engineers, visual observation left much to be desired. Engine valves open and close 2,200 times per minute when the engine operates at a speed of 4,400 r.p.m. Obviously, even superb eyesight and aural perception left much to be desired insofar as absolute accuracy was concerned. The camera-recorder combination provided the first accurate evaluation of performance. Operating at 15,000 frames per second the camera made a visual record of how fast the valves opened, how long they stayed open and how rapidly they closed. When projected, the actions which took place in split *seconds* in the engine, were on the screen for a matter of *minutes*.

The tape recorder fulfilled its share of the assignment by making an audible record of the noise levels of various types of camshafts. By playing the recordings back under controlled studio conditions it was possible to determine which camshafts gave the quietest, most efficient performance.

Memory Master How many times have you had a sudden inspiration—the solution to some tough problem—sprint into your head while you're driving to work? No chance to write it down . . . but you'll remember it when you get to the office.

Then the morning mail to read . . . reports to get off . . . a hurried conference with the boss . . . lunch with a client . . . and now time to get at that problem. All solved? More than likely *not*. You've forgotten that "perfect solution" already.

It happens to all of us—particularly those in a creative business where ideas are our stock in trade. Not only in our cars, bucking the morning rush from suburbia . . . but in the office and at home. Frequently, writing out the details is too tedious a process and not nearly "fast" enough.

For many an idea man, the tape recorder has proven to be the answer. Ideas can be recorded as fast as you can talk—much faster than moving a pen over a note pad . . . even if you're a shorthand whiz. One businessman, who claims that he gets his most brilliant ideas while shaving, has installed a tape recorder in his bathroom and talks his head off while dragging a razor across his stubborn stubble. He probably gets plenty of unintelligible words and a few "ouches," but he swears that the idea has paid off in his business.

The most popular use of a tape recorder as a memory master, however, is in the automobile. Back in the days when old Dobbin could do most of the thinking while traveling from place to place, it was a simple matter to read or jot down notes while enroute. But with today's traffic and high speeds, hands and eyes are needed to preserve life and limb.

A tape recorder with either a microphone or foot pedal off-on switch utilizes about the only faculty left—the mouth. It's a simple matter to set the tape to moving and record ideas which can be transcribed by a secretary or played back for further consideration later in the day. It may take a few days to get adjusted to the not-too-difficult requirements of this type of recording, but those who use it regularly report that it soon becomes simple and practical.

The tape recorder in the car also provides an excellent opportunity to review recorded minutes of business meetings, salesmen's reports, technical briefings, etc.

Recently an organization in California started a program of providing doctors with tape recorded digests of medical articles which they can "review" as they drive between calls—about the only "free" time in their ever-busy schedule.

There are few tips we can offer on the mechanics of using a tape recorder as a memory master—except to caution you not to become discouraged at the outset. It takes some time to get used to talking aloud to yourself—and even more time to get the knack of organizing your thoughts for storing on a roll of tape. As we said in an earlier chapter, however, the very first letter you *dictated* was by no means the easiest letter you ever "wrote." As in everything else worth while, persistence pays

off with big dividends, and learning to use a tape recorder as a memory master is no exception to the rule.

Entertainment While Traveling The tape recorder even provides a medium of entertainment for those who travel—either for business or pleasure. Pre-recorded “programs” can be packed in the suitcase or briefcase and played back to fill otherwise idle and boring moments spent in motel or hotel rooms.

“Pre-recording” can be done either by you or by the companies which specialize in the production of such tapes. If you do it yourself you spend nothing but your time and the cost of the tape. If you buy a pre-recorded tape you, of course, will spend more money for your “entertainment.”

One distinct advantage to using your own recorder and tapes for entertainment while traveling is that it doesn't cost you a quarter every time you want music. It's not so much the quarter, but when you use your own machine, you *know* the instrument isn't going to “run out of time” right in the middle of the “program,” as so frequently happens when you're listening to the radio or watching a TV program on coin-operated machines in a motel or hotel.

Idea Exchange A Los Angeles organization involved in an extensive direct selling operation uses tape-recorded idea sessions for turning good ideas into better ones and for finding the loopholes in basic sales ideas of dubious value.

Being national in scope the company has strategically located branch offices throughout the country. New sales or promotional ideas are recorded by the originator (*not* always the home office) and sent to other branches for evaluation and comment.

This system offers dual benefits: 1) from a recording sent by a group in the southeast, a group in the northeastern part of the United States may learn something of value which it can apply to its own sales efforts; 2) the group which receives the recording may have previously tried the same or a similar

PART THREE

10. NON-BUSINESS USES FOR THE TAPE RECORDER



CHAPTER 10

NON-BUSINESS USES FOR THE TAPE RECORDER

WHILE THIS book is intended as a guide to the applications of the tape recorder as a modern business machine, it would be an oversight not to include a brief list of "non-business" uses. Very frequently, the same recorder which performs daily miracles in the office, factory or store finds its way into the home at night for double duty.

Actually, there have probably been far more home uses developed for the versatile tape recorder than business applications. It has become a popular medium of entertainment . . . a device for training children . . . a helpful tool . . . a way to record for posterity sounds which, unless recorded, are lost forever.

The fact that almost any member of the family can operate and use a tape recorder has become one of its primary selling points. This has brought a many-sided effort in the development of home uses.

PARTY GAMES

Party occasions are when the tape recorder in the home really comes into its own. Never before has there been avail-

able a "tool" so useful as a cornerstone for interesting and unusual party features.

The tape recorder takes over where the once-popular home movies or stereopticon slides left off. For, unlike these previously popular devices, the tape recorder presents an excellent opportunity for the guests to actually *participate* in all phases of an entertainment activity.

No list could possibly record all of the many new and exciting party games which have been developed by the proud owners of tape recorders. The list we present here can serve only as a *starting point* from which readers can develop their own favorite party uses for their recorder.

One note of caution should be sounded immediately, however. The tape recorder can become the demon which home movies and the stereopticon once became if it is forced on guests at every occasion. To be most effective, it should be used sparingly—and preferably in a new and different way each time.

Being "new and different" can also be a handicap. Many an otherwise pleasant evening of fun has been ruined by the failure of the host to allow for adequate preparation. What seems like an excellent idea at the moment of conception often falls flat when put to actual test. And, if that actual test is after friends have congregated, it can be the spoiler of the entire party. It's just like the "old" days when the home movie bug forced everyone into the darkened parlor and then found that the projector wasn't working or that all of the films needed to be spliced or rewound.

Actually, tape recorder miscues can be even more of a fiasco since the guests are called upon not only to act as an audience (with home movies, when the lights are out, a non-snorer could get away with a quick snooze if things got too boring), but as part of the "cast" as well.

Perhaps this general checklist, although not applicable to every party game or stunt, can serve as a guide to help prevent a fouled-up evening due to recorder failures:

Party Game Checklist 1. *Is the recorder in perfect working order?* Don't just play a few seconds of an old recording—let it warm up for several minutes, then record for several minutes and be sure to playback everything recorded.

2. *Have you plenty of CLEARED tape?* Don't just guess that you have enough tape for the special game you have planned. Estimate the probable length of the game . . . and then make sure that you have at least *double* the amount of tape you estimate is required. Party games have a way of running much longer than originally planned. There's always the reluctant one who bashfully giggles while the recorder rolls merrily along . . . and, of course, there is apt to be the one who becomes fascinated with the sound of his own voice and uses up half a reel just to prove he's not subject to mike fright.

Be sure that the tape is checked in advance. If something has been recorded on it previously, it is best if the tape is cleared to eliminate the possibility of difficulty due to faulty erasing or unrecorded spots during the game which, when played back, have disconcerting noises. It is also well to make sure that any tears or breaks have been spliced.

3. *How about microphone placement?* Don't just assume that it will be a simple matter to just set up the microphone when the time comes. Try it out in advance. You'll want to make sure that your mike cord is long enough and, if possible, placed where it won't be tripping up your guests—particularly if your game requires rapid movement. You'll also want to see that there is plenty of room around the mike for all guests who must use it . . . or at least enough room so that the next "speaker" can quickly and easily move into position when his turn comes.

4. *Recording levels all set?* Chances are that it won't be easy to "ride gain" on the recorder while the party game is in progress. Of course, you get to know what you can expect from your recorder and microphone after you've used it for awhile. But it is always a good policy to test it out in advance for the special event you have planned. Acoustics can vary greatly

from one part of the room to another, so the best test is to have everything in the same position as will be used during the party. Then try it out using different voice levels and, if possible, different voices of the same types as those of guests who will participate in the game. Once you've determined the proper levels, it is best to mark them on the recorder with a grease pencil or a piece of paper Scotch-taped around the recording volume control knob.

5. *Need special sound effects?* If so, they should all be tried out in advance and the equipment placed in a location where it can be quickly obtained when required.

Now, some games:

What's That Sound? One of the best—and most simple—methods to get started using your tape recorder as a source of party entertainment is a guessing game built around common sounds. Strangely enough, when there is nothing visual to go with a particular sound—even though you may hear it every day—it is frequently difficult to determine just what it is.

This game, of course, requires some preparation in advance, but not a lot of time-consuming effort. The best idea is first to make a list of sounds to be guessed. Be sure to include both easy-to-guess and hard-to-guess sounds to make sure that every guest is able to come up with some answers—but not all of them.

Without too much effort you should be able to line up at least 20 or 30 different sounds which can be recorded easily. Don't try to include too many different sounds in a single game, however, or your guests will have forgotten their thoughts in determining the source of the sounds before you have an opportunity to play back the recording and check their answers.

For answering, each guest should be given a slip of paper with a number for each sound . . . and don't forget to have plenty of pencils or pens available for those who come without their own. Then, as each sound is played, the guests write down their guesses as to what it is on their slips of paper.

When recording the sounds it will help if you preface each recording with something like, "This Is Sound Number One." Then be sure to record enough of the sound to make sure every guest has a good opportunity to hear it. If necessary, repeat it three or four times. If you have time, and are clever enough, you may want to add a few clues to help identify the sound—but, of course, not too many to make it too easy.

If you want to keep the game "on schedule" you can insert a blank space on the tape of any determined length before introducing and playing the next sound. Twenty seconds is about the minimum time for guessing, although if it's the first time the game has been played it may easily take a minute per guess.

Here are a few suggestions for easy-to-record sounds:

Dialing a telephone	Striking a wooden match
Uncorking a bottle	An egg beater whipping cream
Shuffling cards	The buzz of a TV set warming up
An egg frying	Blowing up and busting a paper bag
A baby's rattle	Turning the pages of a newspaper
A running shower	The fizz of an Alka-Seltzer
An electric fan	A ping-pong ball bouncing on the floor
Switching on a light	The click of a camera shutter
Unlocking a door	A toilet flushing (always good for a laugh)
Sawing wood	Pounding a nail with a hammer
Pouring liquid	Washing a pan with a Chore Girl
Sharpening a knife	Water boiling
Brushing teeth	Vacuum cleaner

Such a list can go on indefinitely. Just look around and you'll find many additions. It is not necessary, of course, to limit yourself to sounds found around the house. You can move outside with the tape recorder and find a whole new area of possibilities. One interesting variation is to record common sounds around town—and here the possibilities get really endless.

Musical Quiz There are several different kinds of musical quizzes which can be played with a tape recorder. Most of them follow the same basic pattern as "What's That Sound?" Guests are given numbered slips of paper and then asked to identify portions of musical selections. The key to the success of such games is to record just enough of a number for the guests to recognize it, but not enough to completely identify it. If the recording has a vocal on it, the best bet is to record only the non-vocal portions of the record.

To get your musical selections you can use your own record collection or record from the radio or TV. Be sure to write down an exact description of the selection so that you'll have the right answers the night of the party.

Probably the most popular musical quiz is to use portions of popular numbers that were Hit Parade favorites in years past—but be sure not to go back beyond the memory of the youngest member of the party. It will be surprising how familiar the melody of most numbers will be—and how hard it is to remember the title.

You can add variety to this game by asking guests to name the band or vocalist. In such cases you can include, of course, vocal portions of a recording. Sometimes it is helpful to offer some "hints" as to the identity of the person or group to be guessed.

For many groups, classical music is a more appropriate choice. Selected portions of symphonic and operatic records are taped, using passages that are typical or familiar. It is important, however, to avoid dead giveaways such as the opening notes of Beethoven's Fifth Symphony. Obviously, classical music quizzes should be limited to groups where all guests are acquainted with music of this nature—and in such cases certain passages are far too obvious to make the guessing "tough."

There are still other variations on this theme. Some of them include asking the guests to name the year in which a tune was popular . . . the stage musical or movie from which a num-

ber came . . . identify bands by their theme songs—or radio and television shows.

Vocal Quiz Another popular type of quiz game is to ask guests to identify familiar voices. The voices, themselves, can be obtained in many ways. They can, for instance, be recorded from radio and television shows—getting the voices of famous guests appearing on dramatic or interview shows helps. To keep the game to a more topical nature, you can go around the neighborhood or town in advance of the party, recording voices well known to the entire group of guests who will be present.

If you're planning such a quiz, it is wise to begin recording the voices well in advance. As a matter of fact, it makes an interesting hobby to build a library of familiar voices . . . and provides an instant source of material for a game of this nature.

Actually, you can use the guests themselves as your source for voice quiz material. The easiest way to make a game out of this is to have each guest record something in his or her natural voice. Then, when the group has gathered, play the tape *backward* and it'll be pretty hard to recognize a single voice. In this game, it is often more fun to just let everyone call out their guesses, rather than staging a "secret" quiz. One person should write down the guesses, however, so they can be checked against the actual recording when replayed starting at the beginning.

Another variation is to have each guest use a fake voice—such as the famous guests do on the popular TV program, *What's My Line?*

As in all recorded quiz games, it is important to number each recording and then make a list of answers according to the numbers. It is surprising how often the correct answers get mixed up when this simple precaution is not observed.

Mystery Voice Here is another guessing game that is a good "mixer" for a party where most of the guests are not acquainted with each other. The first step in this game is to select one of the guests as the "mystery voice" and

have him or her make a recording in a disguised voice—giving a few clues as to who he or she is. If possible, it is best to make this recording before the party so no guests have an opportunity to find out who is making the recording.

As soon as the guests have all assembled, play the recording and announce that a prize will be given at the end of the party to the person who identifies the mystery person. In order to make a guess, the guests will have to mix and ask some questions—and, as a result, should get to know each other before the evening is over. If you want to speed up the “mixing,” you can, of course, set a time limit—but be sure to allow enough time for each guest to make the rounds.

Ask the guests to write down their guesses on pieces of paper—including, of course, their own names. The mystery person will, of course, have to pretend to make a guess. When all guesses are in, replay the recording and read off all the answers before identifying the “mystery voice.”

Better be prepared for more than one correct answer. You can award duplicate prizes or have the mystery guest draw a winner from those who guessed correctly. Another method of winner selection is to indicate the time when each guess is turned in—or the order in which they are turned in. The winner, then, is the one who made the first correct guess.

Hidden Mike Probably the oldest of tape recorder party “games” is the most simple of all. Just hide a microphone close to a spot where guests congregate, turn on the recorder and let it play the role of an eavesdropper. This is usually good for plenty of laughs—particularly in groups where a recorder is still a novelty.

One big problem in such a stunt is “dead air.” To overcome this it is often practical to have a conversation pepper-upper who knows about the recording and keeps things rolling. He should, of course, never let on that there’s a microphone present, but in certain cases he can fill the dual role of censor to make sure that any off-color or particularly embarrassing remarks are not played back.

Another method of control is to have someone in another

room listening to the recording as it is made—either with ear-phones or the speaker at a low volume. This “recording engineer” can start and stop the recorder to eliminate dead spots or remarks that are not suitable for play-back. If more than one microphone is available, this “engineer” can shift from one mike to another—often with various humorous results. A mixing panel is desirable, but good results can sometimes be obtained by merely unplugging one mike and plugging in another one.

The hidden mike stunt should only be used with a group that already is acquainted—and which has a good sense of humor. One “sour apple” can spoil such a stunt—and the party with it.

Gossip Here’s a “quickie” that takes a minimum of preparation yet can provide lots of laughs . . . and gives everyone a chance to participate.

You start with a typical back-fence gossip item like, “Did you hear that Mable Applegait’s mother has kicked her youngest son out of the house because he won’t look for a job?” You whisper this piece of gossip—or anything else you think of—to the person next to you, who in turn whispers it to another guest.

A microphone can be passed from guest to guest as the tale makes the rounds so that the actual passing of gossip can be recorded . . . or, if this isn’t practical, each guest can immediately go to a stationary microphone (located where others won’t hear what is being recorded) and repeat what has been told to him before passing the gossip on to another guest.

As soon as the last guest has recorded his version of the story, have him repeat it to the group. Then play the recording back. You’ll be amazed at the final version of the original story—and listening to the changes as they took place provides a lot of entertainment.

Tape a Story This game has many variations. It can be played by as few as two people or a large group. It brings the old fireside story teller’s art up to date.

One of the most common varieties is to select a theme for

the story and decide upon an opening episode. The first narrator goes out of the room and records this episode, adding a "chapter" of his own. He stops his narration in the middle of a sentence and tells the next narrator only the recorded part of this last sentence as a clue to what he has said. Each guest tapes an additional "chapter" in this fashion and the last narrator records a conclusion. Then the story is played back for the amusement of all.

Secrecy is not absolutely necessary. Many party-goers like to join in recording a story made up on the spot as the mike is passed from guest to guest around a circle. Usually each story teller adds an episode and tries to make it tough for the next in line to take up where he left off.

In "Tape a Story" games it is usually best to decide upon a theme or conclusion to the story before turning on the recorder. This helps to keep things running smoothly.

There's no need to stick to prose, however. Poetry can be composed on the spot in the same manner.

Add a Line A slightly different version of the story-telling game is to start with all but the conclusion of a story, limmerick, poem, song, or a simple statement. Each guest then reads the part already composed and adds his own ending. The recording should be done where others won't hear what is said. The variety in conclusions will provide plenty of entertainment when played back to the entire group.

Thespians All All sorts of radio-style acting can become party entertainment with a tape recorder. You can start with any kind of script—or no script at all. The game can be serious or all in fun—and either way can make a tape recorder well worth its cost.

Probably the most fun is to make up a play as you go along. This usually starts by having everyone suggest a character. These characters are then written on slips of paper and each guest draws for a part. The mix-ups in casting which result can add a note of fun before the recording actually begins.

To keep things moving along at a fast pace, it is well to select one guest with a flair for the dramatic as the announcer. He or she will then fill in any time the dialogue slackens . . . and "get the show back on the road." The actors make up the plot as they go along, although, as in the story-telling games, it is well to establish a theme and/or the conclusion. Characters can dispose of each other as the plot moves along.

A slightly different version of this game—and one that works well if the group is not too slow on the up-take—is to prepare a master script with certain portions left out. This gives the guests an opportunity to think out what they will say when their turn comes along, although if spontaneity is desired, the leader of the game can point to the guest who is to say the line just as it comes up.

Of course, for those who desire a more professional touch, scripts for actual radio plays can be used.

The Interview Tape recorded interviews present several party opportunities. Not everyone can conduct a decent interview, however, and there are plenty of opportunities for this technique to fall flat on its face. With enough practice anyone can develop an acceptable interviewing technique—but don't force it on party guests until you're sure that it has been perfected.

The interview is particularly useful for introducing guests who are not well acquainted. The interview should be conducted either before the party or in a special room where one guest or couple can be interviewed at a time. It is well to ask questions that give information the guest would not likely tell if asked to present his background in person—otherwise a tape recorder is superfluous. Ask about hobbies, favorite books, movies, TV shows, songs; "What were you doing in 1935?"; most interesting experiences, etc.

If it's a couples party, a neat twist is to get husbands to tell about wives and vice-versa. The same thing will work—and often be more entertaining—when the couples are unmarried.

Generally you'll find that people are more willing to tell a

microphone about themselves than a large group. If you're the collector type, you can build up an interesting guest album by saving these recordings.

There are many other ways to use interviews as party entertainment. One good method is to take a specific question—serious or silly—and then get the views of each guest on the subject. Such interviews can be conducted either before the entire group or in private. Even if the group has heard all the answers while they're being recorded, the playback is always good entertainment—and lots of fun if replayed at a subsequent party with the same guests.

Scavenger Hunts Here's a game that is growing in popularity by leaps and bounds. It requires at least two tape recorders—preferably portables with a self-contained power source.

Party guests are divided into teams—the number of teams depending upon the number of recorders available. Each team is given a similar list of sounds to be recorded and a time limit. From that point they're on their own.

In making the list of sounds to be recorded be sure to avoid sounds which can easily be imitated . . . and beware of anyone who has access to a sound effects library.

There's practically no end to the sounds which can be listed. For example:

- Train whistle
- Fire engine or ambulance siren
- Dog's bark
- Cash register ringing up sale
- Someone who speaks Chinese
- A talking parrot or parrakeet
- Cat's meow
- A bird call
- A horse's neigh
- An airplane take-off
- Church bells or clock
- Ship's whistle or horn
- Telephone coin box registering deposit of a quarter

- Someone playing a specific tune on a tuba
- Train announcement in a railroad station
- Screech of brakes
- Voice of some specific person
- Jack-hammer breaking concrete
- Policeman's whistle
- Whirr of a dentist's drill
- An outboard motor in use

It's obvious that there are hundreds of sounds which can be added to this list. Points should be awarded for each sound depending upon how difficult it is to obtain. In making up the list it is best to include more sounds than can possibly be recorded in the time allowed. This will force the teams to try to arrange their schedules to the best advantage and help prevent two or more teams showing up at the same spot at the same time.

One important word of warning: be sure that some member of each team is fully acquainted with the mechanics of operating a tape recorder and be sure that he is given a briefing on the *specific* tape recorder he or she will use.

It often adds interest to the recordings if the team is required to add a recorded "note" after each sound has been recorded, telling how and where it was obtained.

If this game is too involved, there are many simple variations of it. The easiest, of course, is to make up a list of common household sounds. Other ideas: a list of individuals' voices; musical selections; sound effects, etc.

Tape Roulette A tape recorder can prove to be a good substitute for a roulette wheel. The idea is to record a series of numbers on the tape—not in numerical order, but scrambled up. The tape is then played at fast forward or fast rewind speeds and suddenly stopped. It is then played forward at the normal speed. The first full number heard is the winning number. Or, to add more suspense, it can be the second, third or fourth number heard.

In making the recording for this game, it is important to allow from two to five seconds between numbers so that there

will be no question as to the winner. If the numbers are recorded too closely together, it is possible to hear the tail end of one number and then, immediately, another complete number. In such a case it is often hard to determine who should win. Proper "spacing" of numbers eliminates this.

This same technique can, of course, be applied to any game which requires a drawing. Bingo, for instance, can be played by recording the numbers. There will likely be some repetition of numbers, but it is a simple matter to "select" a new number by letting the tape run forward until a previously unselected number is heard.

Fill-in the Blanks Here is another quiz game which takes on added "sparkle" when played with a tape recorder. Questions are recorded in advance—just like the musical selections in one of the musical quizzes mentioned earlier. The guests then put down the answers on a slip of paper after listening to a playback of each question.

With the recorder it is possible to introduce more variety into a quiz than is normally possible. Musical selections, famous quotations, identifying sounds, etc., can be used to add variety.

One of the best ideas is to give incomplete statements and have the guests fill in the missing words. As an example, you can record the vocal from a well-known song. Then select certain words and erase just this portion of the tape. It's now up to those playing the game to "fill in" the erased words.

The more dramatic you can make the quiz, the more valuable a tape recorder can be. You can pretend, for instance, that you are a newscaster describing important events from history. You treat the subject just as though you were on the scene—leaving out only the names of the person or people involved. That's for the guests to guess.

This same twist can be used in many ways. You can, for another example, describe famous cities as though you were on the spot . . . or you can pretend that you are conducting interviews with famous personalities.

Most of these things would be pretty difficult to do "live"

since the guests are apt to be paying more attention to you and your little act than concentrating on picking up enough clues to guess the right answer.

Dancing The value of a tape recorder to provide music for dancing is pretty obvious. One big advantage is that you can record a half hour, an hour or more of music on a single tape . . . thus eliminating the headache of having to change records frequently. You also can insert "breaks" between dances (without ever having to touch the recorder). And safety, too—you eliminate the chance of breaking your favorite discs.

In setting up a dance program for the evening, be sure to get plenty of variety into your selections. You'll first want to evaluate the type of music most preferred by your guests. Be sure to include some of the favorite types of music of *each* guest.

When recording the selections, be sure to allow sufficient blank tape between numbers and sets. You can take a lesson from dance bands on this score. If you want to save tape, you can shut off the recorder for a pre-determined interval between sets . . . but you'll find your evening much less trouble if you will just let the tape run. It'll also help to keep things organized if you include one of those little "time-to-take-a-break" tunes at the end of sets—just like a dance band. If there's a piano handy, you can play a few chords of your own . . . or you can select a catchy phrase from one of your records and repeat it at the end of each "set."

If you have a large group and want to work in "mixer" dances, the tape recorder will make it a simple matter. One of the easiest ways is to stop a number party way through, allowing enough time for everyone to change partners. This should be repeated often enough to give everyone a chance to dance with several partners.

These are not, by any matter of means, the only party games which can be made more successful by use of a tape recorder. One easy way to develop others is to take any book of party

games and try to visualize how a tape recorder can be used for it. You'll be surprised at how many applications there are.

TAPE RECORDER HOBBIES

A tape recorder can be a wonderful asset to many hobbyists. Some of the more obvious hobby uses include the recording of bird calls, jazz, folk songs, etc.

Actually, tape recording itself has become a hobby for many. Sometimes it is tape recording alone . . . and for others it is as a part of other electronics hobbies. A tape recorder, for example, is considered a "must" for the high fidelity fan. For the so-called "ham" radioman, a tape recorder is another piece of gear to add new dimensions to his favorite pastime.

Other hobbyists can make good use of tape recordings to exchange "sound letters" with hobby information . . . minutes of club meetings and talks by guest speakers . . . sound to go with pictures . . . etc.

For the photographer, a tape recorder presents the ideal method for adding sound to his pictures—either stills or motion pictures.

For the stamp or coin collector, the magic of tape helps save time and trouble in communicating with other collectors at distant points. He can quickly go through his duplicates, for example, "listing" them on tape and arrange swaps with fellow collectors who answer by return tape.

Bird watchers can swap the calls of native birds with their contemporaries in other areas.

"Liars' clubs" can . . . well, the idea is obvious. A tape recorder can expand the horizons of any hobbyist.

But to the thousands of popular hobbies, the tape recorder has added some new ones:

Tape Clubs These clubs are composed of both the real "tape bugs" and just plain owners of tape recordings who like to get together and discuss tape recording and do interesting or unusual things with their recorders.

Activities of the various major tape clubs are reported frequently in *Tape Recording* magazine (published by Mooney-Rowan Publications, Inc., Severna Park, Md.).

Recorded "Autographs" The old autograph book is giving way to the portable tape recorder with which the autograph hound captures words spoken by his friends, acquaintances and favorite heroes. Collectors frequently "swap" word autographs by re-recording.

Sound Hunting Another hobby which has developed as tape recorders have become more popular is the collecting of sounds—not just artificial sound effects, but the "real thing," recorded on the spot and filed, shared and traded like stamps, coins or trading cards.

Discussion by Mail Still another application of the tape recorder in the hobby field is the development of tape discussion groups. Many people are taking pet subjects and discussing them with others at distant points by tape recordings. Each person, in turn, adds his comments to a tape and sends it along to another.

Recorded History A particularly fascinating tape recorder hobby is "collecting history." Usually the collector records news reports from radio broadcasts. The tapes are edited and filed according to subjects. Others will record actual events in their lives.

Radio Quite similar to "Recorded History" is the collection of any kind of radio broadcasts. Some hobbyists collect only an individual series of programs; others just "radio" in general.

Because of the relative newness of the recorder, its applications as a hobby tool have yet to be fully explored. Undoubtedly it will continue to become more important in this field.

BUILDING TAPE ALBUMS

The tape recorder really assumes a role of importance for the owner when applied to the task of producing "tape albums." Such albums can take on many forms. Basically, they are the "sound" counterpart of the "visual" photograph album. And, just like a photograph album, they can cover many subjects.

As a matter of fact, tape albums frequently become a supplement to photograph collections—or *vice versa*. Sound is meant to go with "the sight" and can certainly help to recapture fond memories.

It would be impossible to catalog all of the potential uses for a tape recorder in producing sound albums. Probably the best way to visualize the possibilities is to go through your own photo collection and figure out those pictures which would mean so much more if they were accompanied by a tape recording. In the previous section on "Hobbies," several possibilities were mentioned.

To help explain the potential of this application for tape recorders, consider just one possibility—a sound album of your next vacation. Vacation trips take on a new dimension with the addition of a tape recorder—either coupled with a camera (motion picture or still) or by itself. A complete sound record of the vacation can be accomplished with less effort than taking pictures.

In most cases, the best job can be accomplished with a portable unit with its own power supply. This, of course, enables you to record things beyond the reach of electrical power. However, interesting tape recordings can be made with any type of unit. If it's a vacation trip by automobile, an inverter unit in the car can provide a recording studio that follows wherever you go.

The first time around will probably produce the same type of results which the camera bug gets on his first vacation trip with a camera—too many pictures, many of which would be

taken in a different way the next time . . . and many subjects worthy of remembering, overlooked.

Here are some tips, though, which may help to turn out a prize collection of sounds as a lasting memento of a cherished vacation:

- Don't try to do the editing on the spot. Record all of the highlights and plan to devote a little time each evening to editing. This may also give you a chance to pick up, the next day, things missed.

- Let others do the speaking for you wherever possible. If there is a guide describing something of interest, record what he has to say. It'll give an authentic touch and more "color" than you could possibly provide yourself. You can always add your own comments.

- Don't overlook the sound effects. Keep "an ear open" for anything that may provide interesting background noises for narration or photographs. Try to get sounds that tell a story—the sound of your car going through a tunnel . . . the chirping of birds in a forest . . . the breaking of waves along the ocean . . . city traffic noises . . . the crunching of gravel on a hike. Don't overlook, however, somewhat commonplace sounds which may add "color" to your recorded story—the starting and stopping of your car . . . the night noises through the window of your hotel room or motel . . . the passing of a train . . . etc.

- Record story-telling conversations wherever possible. This will help to inject yourself into the record without having to rely on straight narration. The possibilities are numerous—asking questions of natives . . . registering at the hotel, resort or motel . . . buying souvenirs . . . getting directions from a policeman or service station attendant . . . discussing what you will do during the day or what you have seen . . . etc.

- Plan in advance. This can be the most important success factor of all . . . but don't overlook something of interest just because it isn't "on the schedule."

- Keep thinking in terms of the finished sound album. Don't wait until the last minute to get all of the "extras" you will want.

- Don't try to produce the finished recording until you have all of the tapes recorded. The last thing recorded may be the best of all.

- Save the "narrative links"—the words which will tie the whole story together—until all editing has been done. If you try to add these comments as you go along, you are likely to find that the album becomes far too long.

- Keep a complete record—including actual recording time—of everything put on tape . . . and be sure to mark all reels with adequate identification.

- If the recordings are to be linked with photographs, edit your picture collection first and then add the sound to go with it. You may want to revise the whole thing several times, but in the long run you will find that the pictures available will "set the pace."

- Don't give up if your first stab at a recorded vacation album is a failure. You'll be surprised at how soon you learn how to work the "bugs" out of the operation.

While we have suggested that you look to your photograph collection for basic ideas for tape albums, don't stop there. Many people obtain a great deal of pleasure from recordings that have nothing to do with pictures.

For example, you might like to record "a thought a day" . . . keep a diary on tape . . . develop a collection of your favorite records on a few, easy-to-play tape recordings (or, as some have done, make a tape album of your friends' favorite records). The possibilities are endless.

THE TAPE RECORDER AS A HOUSEHOLD TOOL

Only one's own imagination sets a practical limit to the countless uses to which a tape recorder can be put as a valuable household tool. It can jog the memory, soothe jangled nerves, supervise housekeepers, baby sitters and tradesmen, serve as a baby alarm and even cut the cost of the monthly phone bill.

Consider the use of a tape recorder as an aural blackboard or note-pad, replacing the old kitchen blackboard as the home message center. It's hard to overlook a hastily scribbled note—

when its been *recorded* on the tape machine. A family soon develops the habit of checking the recorder regularly when they come home and nobody else is in the house. Where's Junior—or Dad—or Mom—or, did Susie receive a phone call while she was at the store? A flick of a switch can answer these questions if they're on tape. Odds are the information will be more detailed than it would have been in written form—and usually much more decipherable. When Mother goes off shopping before the kids return home from school, she can leave full instructions. Or, if a bridge game might extend through supper time, Mama can give Father the sad word via tape before she leaves—along with instructions on what shelf to check in the refrigerator.

When it comes to getting through some of the monotonous chores of the day, a tape recorder can go far toward making the load bearable and, possibly, even a bit pleasant. Music can make your mood! You choose the mood you want—or *don't* want—and music can help you get your desire. This fact has been proven by no less a group of experts than the staff of the Music Research Foundation of New York. Add to the Foundation's findings the discoveries made by an eminent psychologist-musician who heads the music department at one of the nation's leading universities, and you have a virtual catalogued recipe book of literal "mood" music you can store on tape for use when the situation warrants. If you awaken tired and irritable in the mornings, try listening to the finale of the *William Tell Overture*. Follow that by a couple of Sousa marches—*Stars and Stripes Forever* and the *Washington Post March*—and you should be (according to psychological tests) well on the way toward a pleasant disposition for the remainder of the day. If you're nervous or jittery when you come home from work, skip to the portion of your "mood tape" where you've previously recorded *Rhapsody in Blue*, followed by *Claire de Lune* and the first movement of the *Moonlight Sonata*. The fact is—and it's a *proven* fact—music can have a therapeutic value. The mechanics of the therapy are considerably simplified if the music is put on tape and kept, ready for immediate use.

With a tape recorder, the weight-conscious housewife no

longer has to plan her entire day's schedule around the 10:05 a.m. "Ladies, Watch Your Weight and Diet" program, on which the expert describes various exercises and then calls cadence for their execution. She can record several of the programs on tape—descriptions and cadence-counts, both—and have them ready for use earlier or later in the day, at a time which better coincides with her preferred schedule.

Recorders are excellent tools for establishing a schedule or conveying instructions to others, too. On Mom and Dad's night out, complete instructions can be left for the baby sitter. During the day, when Mom will be gone at the time the plumber arrives, she can recite the difficulties to the tape recorder and the plumber can get the full story on which faucet is dripping or which drain is plugged and what the family would like to have done about the trouble. Obviously the same technique is applicable to instructions for the once-a-week maid or any other individuals who would normally work under the supervision of an at-home housewife.

Checking on infants is another capability of a tape recorder, and it isn't even necessary to use tape! During nap-time, a mother can go about her business in other parts of the house and still hear every whimper or sound coming from the nursery. The method is simple: The recorder is placed just outside the room, with the mike plugged in and placed inside the nursery next to the crib. With the volume control turned up high, any sound the baby makes will be amplified considerably so that mother, in a distant room, can come running if she hears an unusual noise.

One thrifty family in the East has used their recorder to economize on the phone bills which usually mount up during holidays, when they call "home" to the rest of their family, which happens to be on the West Coast. The calls are a "community project," with everyone from Pop to the family parrakeet participating in the conversation. Six minutes total was the maximum time allotted for the call. Before calling, everyone "had their say"—on tape. The total recording was timed and revisions were made in the "pat" speeches to allow time for answers and comments from the other end. The system worked

very effectively with the children—who previously had a habit of wandering off the topic, at great length. The only non-conformist turned out to be the parrakeet, who refused to talk during the allotted time.

Obviously there are many other methods of using the tape recorder to simplify or organize household tasks and chores. These are only a few, intended as idea stimulators.

RECORDING SPECIAL EVENTS

Everyone who owns a tape recorder can have his own, personalized *Hear It Now* series. Mother's installation as president of the local garden club or Junior's first high school debate would probably not rate coverage by Edward R. Murrow, but to the family involved the events are more important than the world-shaking happenings captured on Murrow's famous record.

Taking a cue from Murrow, a Madison, Wisconsin obstetrician talked his way through a complete delivery. Every sound—from the doctor's first words of reassurance to the mother, to the baby's first cry—was put on tape. Later the tape was broadcast over radio station WISC in Madison. Capitol Records ultimately edited the tape to 30 minutes and released it in disc form.

Weddings are another and more conventional "special event" many recorder owners have "covered" with success and pleasure. For some time there have been professional recording organizations which could be hired to do the job. Some of these very professionals have made the flat statement that equipment owned by the average amateur is satisfactory for recording weddings—if the amateur knows his recorder thoroughly and plans the session in detail. The professionals consider a tape speed of $7\frac{1}{2}$ ips a must for weddings—even those performed without music. A minimum of two mikes will probably be required to do a good job—one set up (*and concealed*) near the altar, to catch the voices of the minister and bridal pair, and the other near the choir or soloist.

On weddings, to do a competent job, a third mike—placed

near the organ—will also be needed. Exclusive of the time it takes to set up the mikes and recorder before the wedding, the recording session tends to run about 45 minutes—the length of the average ceremony. The recordings usually begin with the chiming of church bells or the organ music played while guests are being seated. It ends with the recessional music. Usually the quality of the overall recording is considerably enhanced by editing. The editing may be simply the deletion of any extraneous “noises” or it may involve the addition of post-recorded commentary which includes names of the bridal pair, their parents, the minister and soloist and describes the costumes of the bridal party, and the step-by-step progress of events.

Church sermons are another example of a special event many tape recorder owners have successfully recorded. Easter and Christmas sermons, as well as the sermons of other religious holidays make excellent inspirational records to add to one's permanent collection of tape recordings. In addition to their obvious home use in the religious education of children, such recordings make excellent “program material” for semi-social meetings of church organizations. A library of such recordings is also excellent for use in remote communities where either there is no church or no regular minister. And in instances where a minister's work load is extremely heavy, volunteer workers can help him service his congregation by taking the recordings into the home of shut-ins who otherwise would not be able to “get to church.”

Another example of a typical “special event” which lends itself to tape recording is the home musicale. The advent of “hi-fi” recording systems has considerably increased general interest in classical music. Many informal “clubs” have been formed for the purpose of spending an evening once or twice a month to listen to a home “concert.” Usually some member of the group acts as narrator and provides “program notes” for the selections played. When the desired commentary is on tape it tends to be more succinct and well organized than when some member of the group does it “live.” Another advantage of having the entire musical on tape is that it can be retained

for future use—with the preparation and effort being expended only once, at the time the original recording was made.

RECORDINGS OF AND FOR THE CHILDREN

Recordings of this type might be considered a "Memory Album in Sound." They can also be quite utilitarian, depending on how and when they are used. Daddy's tape-recorded bed-time story will make "interesting listening" 20 years from now—for Mom and Dad, as well as the then-grown offspring. So will birthday parties, brother-and-sister "differences of opinion," Sunday School "orations," recitals of Boy or Girl Scout mottoes, etc.

With children, probably one of the most practical uses to which the home tape recorder has been put, is to help solve problems of discipline. A playback of a childish tantrum, for example, can often work wonders on the errant child. A nationally known magazine photographer and his wife rely heavily on recorded sound to solve a sound problem. One evening when their two small youngsters began "mixing it up" verbally, their parents unobtrusively made a tape recording of the entire event. When the turmoil subsided the two boys were called to the living room and exposed to the recording. Their shouts and cries, accusations and counter-accusations suddenly materialized out of nowhere—nowhere except the recorder. The boys listened, first in bewilderment, then in amazement (amazed at the silliness of what they heard) and finally in amusement. They had never realized how they sounded to others. They finally began to laugh at themselves and the recording was turned off. That tape is considered a valuable possession. Whenever the boys begin to show storm signals, someone in the family quickly turns on the tape recorder. The boys stop to listen—and laugh—and the storm subsides even before it starts. For practical reasons that particular tape is left on the recorder, ready for immediate playback, whenever the recorder isn't in use for some other purpose. Mom and Dad report that innumerable incipient fights have been stopped, simply by the flick of a switch.

The bed-time story is another area in which the tape recorder does an admirable job. Many a parent, weary of reading *Goldilocks and the Three Bears* for the umpteenth time, has found the magic of the tape recorder a godsend. A variety of the child's favorites can be put on a single tape—ready for immediate recitation whether or not Dad or Mom feel capable of fulfilling Johnny's bed-time demands.

Bed-time tapes are also mighty handy for evenings when the number one story-teller is absent. Baby-sitters have found such tapes an invaluable aid when they undertake the sometimes monumental chore of getting the pride of the family firmly—and finally—tucked into bed. And even when the chief story-teller will be on hand at zero hour a tape recorder is still an asset—particularly for the narrator who fabricates his or her own tailor-made epics. After a responsive chord has been struck with a certain type of story or character, the parent can compose additional episodes at leisure—without facing the problem of having to draw the next sentence “out of the air” while young Janie or Johnny wait with bated breath.

Birthday parties are another natural for the tape recorder. The unique din of assorted small fry singing “happy birthday” or discussing the relative merits and demerits of *this* party as compared with the one last week at Mrs. Jones house—where the cake had *green* frosting—may be trying on the ears at the time. Five, ten or twenty years later it will be a priceless treasure in sound.

Not only that, but it is an unimaginative or unresponsive Mama or Papa who, having a tape recorder, doesn't begin to record the career of his child on tape—from the first lusty yell in the hospital crib to graduation day at college. Tape captures all these sounds perfectly—and preserves them intact with unchanging fidelity through the years.

Tape recorders can do much, also, to facilitate and simplify the process of “home education.” Spelling lessons and vocabulary improvement can become games to be enjoyed, rather than chores to be endured by the junior members of the family. For example, one of the parents can record a favorite poem or story, leaving out various words or phrases and pausing long

enough for the listener to spell the missing words or fill in the missing sentences. Also, in teaching children to tell time, a tape recorder can be even more effective than the promise of a Davy Crockett wristwatch. A recording of the booming hour-chimes of a clock, plus a voice-commentary as to the meaning of each, makes "time-telling" a game. Next, a rearrangement of the sequence of the hours being struck off, turns an old game into a new one—and outwits a natural tendency toward memory by rote.

THE TAPE RECORDER AS A TRAINING DEVICE

Over one-third of the country's schools are presently using tape recorders as a standard training device. There is absolutely no reason why recorders can't be used for the same purpose in the home. The "training" by no means is restricted to children—Mom and Dad can benefit equally, and sometimes even more.

Music students have come to consider a tape recorder their particular boon. Solo performers can evaluate their own performances during practice sessions. Regardless of determined objectivity on the part of a student it is extremely difficult to make a critical analysis of his own efforts. He is too busy with mechanics—manual or vocal—interpretation, phrasing, etc., during rehearsals to absorb the overall impact of a complete composition. An immediate playback of the effort, with the soloist faced with the necessity for doing "nothing but listen," can be almost as beneficial as criticism from an instructor. Unconscious and repeated mistakes can be detected instantly—and marked on the musical score as a warning for the future. Faltering delivery or lifeless rendition of a song or instrumental composition are immediately obvious to the discerning listener, who is then in a position to make necessary and warranted changes.

Still in the music field, a tape recorder can serve other functions than performance evaluation. For a singer who has no piano in his home a recorder can provide the necessary piano or orchestral accompaniment. For the member of a choral

group or an instrumental ensemble, a tape recording can provide the "missing" members for his individual practice sessions.

Another use for the tape recorder is in the field of music appreciation. For those who wish to become familiar with the names of composers, performers and arias, as well as with the melody itself, a prepared commentary can be added to a tape containing a number of varied selections. Before each selection the narration can specify the name of the work, the composer, the artist and possibly some of the interesting background information associated with the particular composition. Then, in the future, instead of listening to a stack of disc recordings played on a record changer, and speculating as to whether the third record is an excerpt from *Madame Butterfly* or *La Boheme*, there will be no doubt; the commentary specifies what is about to be heard, before the music comes off the tape.

Speech correction is another training area in which the tape recorder stands out in home use. When Mom or Dad is called on to make a speech at one of their clubs or for some local organization, a few rehearsals for the tape recorder will serve to strengthen personal self-confidence, delivery, style and verbal composition. Poor language habits of pronunciation and diction become obvious immediately when listening to a playback. Also, the speech can be timed accurately, and lengthened or shortened to meet the requirements of the occasion.

Foreign language study has been simplified considerably by the tape recorder. It is a recognized fact that constant usage is essential to the maintenance of facility in a foreign language. When only one person in a household is studying the language the need for a "conversationalist" is all the more acute. A tape recorder can serve admirably as a substitute. Vocabulary lessons can be recorded and then critically analyzed on playback. A series of English words can be put on the tape, with pauses between each word, and the student can listen to a playback and supply the foreign language translation for each word during the periods of silence. Oral reading in the foreign language can also be recorded, to develop the facility in pronunciation and phrasing which cannot be obtained by silent reading. Another study aid available in many cities is the foreign language

broadcast programs of local radio stations. These broadcasts can be tape recorded and played repeatedly while the student analyzes the idiomatic sentence structure and pronunciations.

Devotees of folk and square dancing have discovered that the tape recorder is an invaluable tool with which to teach new groups the intricacies of various dance steps. Instructions or dance calls are tape recorded along with the appropriate music and then the instructor is free to participate in the actual execution of the various dances, along with those he is instructing. Also, for instance, if an expert, qualified "caller" can't be present at a square dance meeting, his taped calls will allow the session to proceed without him and the participants will still have the benefit of proper and effective instructions.

A group of law students in a western university relied on a tape recorder for their "note taker." Five students comprised the group. In turn they each took written notes on assigned lectures. The one who took the notes then made a tape recording of the lecture as he recalled it from his notes. On a designated evening the group met together and listened to all of the recordings and then discussed and analyzed what they had just heard. The recordings served to jog each individual's memory on some point that may or may not have been on the tape, and this was relayed to the others in the group. Just prior to examination time the recordings were reviewed again, leaving the students thoroughly prepared for the examination.

These few illustrations serve only to indicate the extremely wide range of uses the tape recorder has as a training device. Any limitations it may have are probably not mechanical but rather those based on the user's personal imagination or desires.



PART FOUR

11. HOW TO SELECT A TAPE RECORDER

12. HOW TO OPERATE A TAPE RECORDER

13. ACCESSORIES AND HOW TO USE THEM



CHAPTER 11

HOW TO SELECT A TAPE RECORDER

BUYING A TAPE recorder is like buying a set of engravings for printing—you want to buy the kind that can perform up to a set of predetermined specifications.

You don't buy zinc photoengraving plate when you want two million printed impressions. By the same token, if you require a "studio-quality" tape recording you shouldn't expect to get it with a recorder in the "zinc class"; you'll have to move up into the copper and electro bracket. Naturally the price is higher.

Whether you're buying art work, paper stock or printing, each job has a set of minimum specifications. After you've analyzed the specifications on any job the rest is easy—you figure out what qualities and characteristics are implied in the specifications, then you make a selection.

For tape recorders *we* can't codify *your* individual needs and desires. However, we can provide a set of specifications showing characteristics which are "musts" for various uses of a recorder. That's the purpose of the accompanying chart.

If you're an audio engineer, the chart—and this chapter—is probably not for you. The chart lists the factors which are most significant to most people who buy or plan to buy a *portable* tape recorder. No table models, consoles or special purpose

machines are covered. This chapter is not intended to be a definitive treatise on the care and feeding of tape recorders in general. Instead it is designed to give the interested layman an idea of how to spend his money wisely when he buys a recorder for business or pleasure purposes.

Incidentally, don't try to buy a recorder that matches the chart from top to bottom. Such a machine just doesn't exist—at least not as of this writing. The chart lists a hypothetical "ideal" recorder embodying the best features of a number of machines. If one like this is ever put on the market, we'll be the very first one to run down to the nearest appliance store to purchase it.

Let's analyze the kind of recorder that would elicit such an enthusiastic reaction.

Tape Speeds Tape speed* is important for two primary reasons—operating economy and fidelity.

Most machines now on the market give you a choice of *two* consecutive speeds—15/16 and 1⅞, 1⅞ and 3¼, 3¼ and 7½ or 7½ and 15 ips (inches per second). Obviously you can record for a longer period on a 7" reel (1200 feet of standard tape) at a speed of 3¼ ips than you can at 7½ ips. However, at slower speeds, fidelity suffers due to a limited frequency range (the overall range of cycles per second of faithfully reproduced sound).

Machines operating at 3¼ ips are usually adequate to cover the frequency range of the human voice. At speeds of 7½ and 15 the range is extended and music can be satisfactorily recorded. That's why an ideal machine would cover the speeds shown on the chart: You'd save on tape for voice recordings and yet still have the higher frequency response of the higher speeds available—if and when you needed them.

If economy of operation is your main interest, pick a recorder in the lower speeds—up to 3¼. If fidelity is important, you're stuck with a higher speed machine.

Frequency Response Tape speed is *not* the only factor affecting fidelity or frequency response. Other factors are mentioned below. The frequency responses

* For a compact definition of all technical terms used in this and following chapters, see Glossary, pages 193-209.

SPECIFICATIONS FOR AN IDEAL (NON-EXISTENT) PORTABLE TAPE RECORDER

The specifications shown on this chart represent the "ideal" features of a tape recorder for business uses. While no recorder now exists which has all of these desirable features, this chart can serve as a checklist in evaluating the relative merits of competitive recorders. All of the items shown on the chart are explained in this chapter.

1. Tape Speeds	3¾ inches per second 7½ inches per second 15 inches per second
2. Frequency Response	50-8,000 at 3¾ 40-13,000 at 7½ 40-16,000 at 15
3. Sound Track	Dual and/or single
4. Number of Heads	3 (erase, playback, record) Plug-in type, adjustable
5. A-B Switch	
6. Recording Level Indicator	Meter-type
7. Equalization Controls	Separate bass and treble controls
8. Signal-to-Noise Ratio	55db at 3% harmonic distortion
9. Reel Size:	10½"
10. Timing Accuracy	3 second variation, maximum, in 30 minute recording
11. Selection Locator	Odometer type footage counter
12. Rewind and Fast-Forward Ratio	Variable from zero to 40 to 1
13. Automatic Tape Cut-Off	
14. Motors	3 (Take-off reel, capstan, take-up reel)
15. Controls	Push keys or buttons (record, play, stop, rewind, fast forward) Remote controls (stop/start, record/play, forward/rewind)

16. Editing Key	
17. Editing Facility	Easy access to playback head
18. High-Speed Start-Stop	Less than one second to full speed or stop
19. Input Jacks	Microphone (adjustable for high or low impedance) Line (radio or phono)
20. Sequential Recording Adapter	
21. Built-in Mixer	Separate and individual mixing controls for recording level of respective, simultaneous inputs
22. Output Jacks	External speaker External amplifier Monitor headphones
23. Speakers	2 (built-in)
24. Amplifiers	3 (microphone and line, record, playback)
25. Power Output	8 watts
26. Operating Stability	8 hours, continuous, no significant change in gain or distortion
27. Public Address Facility	
28. Power Requirements	AC or self-powered
29. Weight	30 pounds
30. Price	\$300

for each operating speed shown on the chart are above what you'd find on most medium or low-priced machines.

On a two-speed machine, operating at $3\frac{3}{4}$ and $7\frac{1}{2}$ you should definitely expect the low-speed range to be no less than 70 to 7500 cps (cycles per second), however, because the range of the average adult male voice is roughly 100 to 8000 cycles. If a recorder has what you want in other respects, there's no point in quibbling over a loss of 500 cycles at the upper end of the band.

At a speed of $7\frac{1}{2}$, machines with less than 65 to 10,000 cps ought to have some other worth-while compensatory factors. When it comes to a speed of 15ips, the range should cover from 50 to 15,000 if you plan to use your recordings for professional purposes. (Roughly, the *average* human ear is capable of hearing tones from 30 to 15,000 cps.)

Sound Track The chart isn't hedging when it specifies "Dual and/or Single Track." It would be nice to have such a recorder because there are advantages and disadvantages to both.

Dual track recordings save tape—you get twice the recording time you do from single track. However, if you want to edit the tape (cut portions of it out and splice together what is left) there's one thing to remember: when you cut out sections of one track you are doing the same to the other. This means that your first recording will sound beautiful on playback—but have you got troubles when you try to play back the second track!

On single track recordings the "signal" (strength of "magnetization" for a given length of tape) is stronger than on dual track. This is basically a function of the total area of a sound track being recorded at any given instant. Obviously there's more area being recorded on a full track than on a half-track. If signal strength is all-important you want a single track recorder. Where signal strength is not paramount, but you still want to edit tape, buy a dual-track machine. You can always record only one track and leave the other blank.

Number of Heads The majority of lower and medium-priced machines use two heads—one for erase and the other for record-playback. Unfortunately the requirements for optimum recording performance are not the same as those for optimum playback performance. As a result, dual-purpose heads can only be a compromise. Naturally this affects the fidelity of both record and playback. If maximum fidelity is essential you need a recorder with three separate heads—one each for erase, record and playback.

Heads that are adjustable—for alignment purposes—are highly desirable. If the recording or playback head is not absolutely perpendicular to the direction of tape travel, fidelity suffers. In a broad sense, a mis-aligned head is similar to tuning *between* two stations on a radio. The most noticeable effect of poorly aligned heads is a loss of high frequencies.

Heads of the “plug-in” type are not only advantageous from the alignment standpoint, but they also allow the same machine to be used for either dual or single track recordings—depending on which heads are installed for the particular recording. It should be pointed out that it takes both skill and patience to align heads—even the plug-in type—so you shouldn’t buy a recorder with this feature, intending to change heads *each* time you make a recording.

A-B Switch This is not usually found on medium and low-priced recorders. For high quality recordings this control is extremely advantageous. An “A-B Switch” allows random switching from the record head *input* to the playback head *output*, during a recording. In this way the operator can use a set of earphones to check the quality of his recording against the quality of the original sound. A switch of this type is only found on recorders having separate record and playback heads.

Recording Level Indicator This is another term for “volume indicator.” It indicates the level at which a recording is being made.

Today there are three general types of level indicators in use: single bulb (which may be either a neon bulb or a “magic

eye”), dual bulbs (neon) and meters which measure current flow.

For high quality recordings a meter is almost imperative. Dual bulbs—one which flickers almost continually and the other which lights when the level is set too high—run a poor second to a meter. A single bulb is the least accurate and most unsatisfactory.

Fidelity is, once again, the main reason to be interested in the type of level indicator on your recorder. If you “overload” a tape (record at too high a volume level) you run the risk of: 1) magnetizing the recording head; 2) increasing the noise level of the *tape*; 3) reducing the effective frequency response of the recorder; and, 4) making it extremely difficult to erase the tape satisfactorily. Any *one* of these conditions is enough to make you unhappy with the finished recording. Taken collectively—you may as well not have made the recording at all.

A meter minimizes the chances of overloading a tape because it offers a more accurate measurement than bulb-type indicators. A meter is also particularly helpful when it is inconvenient—or for some reason impossible—to monitor (listen to) the original sound while it is being recorded. Also, when recording something “cold”—without previous rehearsal—and the probable dynamic range (ratio between the softest and loudest sounds) is unknown and unpredictable, a meter makes it easier to get a satisfactory recording.

Equalization Controls You would probably recognize these immediately by the common name—“tone controls.” These controls either boost or decrease the intensity of low, middle or high tones. Depending on the circuit design they can function only during playback or on both recording and playback.

A single tone control usually does one thing—cuts off (eliminates) high frequencies fed into the mechanism. This produces what is called a “fake bass.” When a recorder has both treble and bass equalizers it is possible to correct certain deficiencies in the recording system and to increase the signal-to-noise ratio.

Signal-to-Noise Ratio To have a ratio you need two numbers. The chart shows only one. It's still a ratio: the missing number is "1." The recommended ratio on the chart is 55 to 1.

The basic reason this is important is that for a good recording you're interested in maximum "signal" and minimum "noise"—comparatively speaking. The "db" after the number stands for decibels—which are nothing more than electrical units of measure, just as a degree of Fahrenheit is a unit of thermal measure.

The "ratio" is the difference between the loudest, undistorted tone recorded and reproduced, and the noise generated by the electronic components of the recorder itself. This is where the "3% harmonic distortion" comes in. This actually means that a tone 55 units (decibels) above a zero level will come out of the recorder the same way it went in, except for a maximum of 3% of a change caused by the amplifier section. It requires a highly sensitive ear to detect a change of this amount.

In a complicated way, the type of noise we're talking about affects fidelity and, for lack of a better word, "listenability." For short listening periods, 35 to 30 db is adequate. For extensive periods, 50 db, minimum, is recommended.

Reel Size You can't cram a 7-inch reel on machines designed for 5-inchers (except in some cases where adapters are available at extra cost). Reel size determines the maximum length of continuous recording you can make on any given machine, at a given speed. Manufacturer's specifications always indicate the maximum size reel the recorder will accommodate. Any smaller size will fit. The larger the reel, the longer the playing (and recording) time.

Timing Accuracy If you want to record a sound track for a motion picture or for TV commercials, this is one specification you should check carefully. The type of motors used in a recorder, as well as the fundamental design of the tape transport (drive) system affect the recorder's timing accuracy.

Unless the recorder is designed to compensate for any fluctuations of the power input (AC voltage or batteries) the tape speed will vary. This can happen during a recording or during a playback. Tape speed will vary in either case. It would accordingly take either longer or shorter than 30 minutes to playback what is on a 30-minute tape. This can be disastrous if the recording is to be used as a synchronized sound track of a motion picture. Scenes will change but the narration will roll merrily along at its own pace.

For this kind of work you need a recorder with accuracy that won't vary more than three seconds, maximum, in 30 minutes. Then be sure to write "loose" narration for individual scenes.

Selection Locator This is also called a "Program Indicator," or an "Index Counter."

Almost every recorder on the market has some type of locator. The similarity stops there. The basic types are: 1) lines marked on the metal, underneath the reels, to indicate elapsed time intervals; 2) radio dial-type pointers which also indicate elapsed time; 3) mechanical counters, similar to an automobile mileage gauge, which measure footage; and, 4) mechanical counters which measure minutes and seconds.

A locator is a virtual necessity if much editing is to be done. With a locator it is possible to find any desired section of the tape, just by noting the readings for each different section. Type three is preferred because it is both accurate and moderately priced. Type four is needed only for motion picture work. Types one and two are the least desirable because they are least accurate.

Rewind and Fast Forward Ratio Even if a recorder is used strictly for pleasure, there will be times when you want to get to a spot in the middle or at the other end of the tape. That's what the Rewind and Fast-Forward controls are for.

For use in business it will frequently be desirable to play

only selected portions of a complete tape. It's annoying to have to wait long periods between these sections. The point to remember is that the higher the rewind ratio the shorter the time delay between specific selections. Today, any machine with a ratio of less than 10 to 1 is definitely on the slow side.

A variable speed control is in the luxury class for non-professionals but in the essential class for professionals. In editing a tape it is usually necessary to seesaw back and forth from one end of the reel to the other. With a variable-speed F-F and R it is possible to slow down at intervals to spot check the content of any given portion of tape, until the desired section is located.

Incidentally, this facility is only valuable on a recorder in which the tape remains in contact with the playback head so that the sound can be monitored. In some machines the tape is disengaged from the heads during F-F or R; consequently, no sound can be heard.

Automatic Tape Cut-Off When the tape reaches the end of the reel—or if it breaks—some recorders shut off automatically. This feature is usually found on the higher priced models, although it is becoming more common on the new medium-priced units.

Motors An absolutely constant speed of tape travel is one of the factors affecting fidelity. When tape speed varies—even slightly—sound quality is changed. This shows up as “wow” and “flutter.” *Wow* is a slow, unsteadiness of sound volume and pitch, similar to what you hear when a record rotates at varying speeds on a turntable. *Flutter* is an unsteadiness of sound volume and pitch, usually noticeable in the higher frequency ranges. The variations result from short, rapid changes of tape speed.

Separate motors for the capstan (the component which drives the tape), the take-off (feed) reel and the take-up reel, reduce the possibility of wow and flutter to a minimum. They also minimize tape “spill” (tape continuing to unwind even

after the capstan stops driving it) and tape breakage due to jerkiness.

Multi-motor machines are usually in the high priced ranges.

Controls Push-button or "push-key" controls, such as those shown on the accompanying sketch of a "typical" present-day portable, are becoming more prevalent on the newer machines. They simplify recorder operation.

There are two basic types—mechanical and electrical. The mechanical buttons work by pressure. The electrical type actuate a solenoid. On a smaller scale, the difference between the two types is the same as the difference between one car with power steering and the other without.

Provision for remote control is another feature to look for when buying a recorder. If you've ever tried to transcribe from a tape to a typewritten page you'll appreciate the value of a remote control. Accessory foot pedals and similar devices to start and stop the recorder simplify the job immensely.

Not too many machines incorporate this feature either as standard or with the use of an accessory. In choosing between two otherwise comparable machines, prime consideration should go to the machine with remote control. The recorder's flexibility is considerably increased.

Editing Key There are times when a tape is perfect from start to finish—except for one very short spot. That's what the editing key is for. There are also times when it's desirable to suspend recording for an instant and then continue. That's another use for this valuable control. An editing key allows these operations to be accomplished without leaving a "sound blip" on the tape—which is what would usually happen if the recorder were turned on and off for the same purpose.

Editing Facility Most non-professional recorders shield the erase and record playback heads beneath an attractive cover plate. Also, the heads are usually arranged for maximum simplification of tape threading. This is a bless-

ing to anyone with ten thumbs. It's a curse to the man who wants to edit tape.

For editing, a recorder should either have an "editing indicator" (a device for indicating exactly where the tape touches the gap in the playback head) or else an easily removable cover plate to provide visual and physical access to the heads.

High-Speed Start and Stop Recorders designed to reach full recording speed (or to stop recording) in anything under one second, are essential for professional use. When a recorder takes too long to get up to full speed, you get the same effect as when you start in the middle of a record played on a home-type record changer.

Input Jacks All recorders have at least two input jacks—one for mike and the other for radio-phono. The ideal situation would be to have at least three input facilities—one each for a high impedance mike (see page 159), a low impedance mike, and radio-phono ("line").

Sequential Recording Adapter It's hard to find this one on today's recorders—even as an accessory. One manufacturer produces a conversion kit which allows the use of the same recorder to record additional sounds on a previously recorded tape, *without* erasing the first sound track. This greatly increases the flexibility of a recorder by making it possible to produce multi-voice recordings on the same tape—Les Paul style.

Built-In Mixer Except on higher priced machines, mixers (a device which allows the simultaneous mixing of several different microphones or other sound inputs on one tape) are usually accessory items. A built-in mixer increases the flexibility and portability of a recorder. Don't write-off an otherwise acceptable recorder if it doesn't have a built-in mixer. This comes close to being in the luxury class for non-professionals.

Output Jacks Almost all medium and low-priced recorders have at least one output jack—for an external speaker. Recorders with additional output jacks offer increased operational flexibility. It is desirable to have outputs for an external amplifier and for earphones, as well as for a speaker. Once again, these are usually found only on higher priced units.

Speakers Some recorders—particularly those in the professional class—don't have built-in speakers. Others have multiple speakers, usually to improve the sound quality of the playback.

Ideally speaking it would be convenient to have some sort of speaker even on high-quality machines designed primarily for use with an external amplifier. This would eliminate the necessity for having to carry two units around—a recorder and a separate amplifier.

Based on present practice, a recorder with two speakers usually has one for the middle and bass frequencies and the other exclusively for highs. If you don't want to go to the trouble or expense of buying an external amplifier and speaker, be sure the recorder you select has at least one, and preferably two or three built-in speakers.

Amplifiers Except on higher-priced machines, the same amplifier is used for everything—record, playback and inputs. This is the same problem as a dual-purpose head—for both record and playback. Optimum performance can't be obtained with one multi-purpose amplifier. Signal-to-noise ratio suffers. If everything else is equal, pick the recorder with separate amplifiers.

Power Output Basically this is an index of the capabilities of a recorder's playback amplifier system. The power output is important if the recorder is to be used by itself for public address purposes or for playback to large groups. Any output of five watts or above is considered highly adequate for most general uses: five watts is enough power to fill an auditorium capable of holding from 200 to 400 people.

Operating Stability Quality recorders can function continuously for amazingly long periods of time with no significant loss of fidelity. If you want a recorder capable of sustained operation under critical performance conditions, it should be able to operate for at least 12 hours without significant change in gain or distortion. By no means are all recorders built to stand up under this kind of an ordeal. There's no point in waiting until a convention or trade show to discover this fact about a recorder that is part of your exhibit. Ask about it when you buy the recorder.

Public Address Facility Some recorders are designed to function as public address units as well as straight recorders. This is an excellent capability to have available in the machine you buy. The size of the built-in speaker, or facility to use an external speaker, and the power output of your recorder are the basic factors to consider. A recorder which can double as a P.A. unit is a wise investment—if it meets all your other specifications.

Power Requirements The ideal recorder would be capable of both AC and battery operation—if nothing else suffered as a result. When used in the field there would be no worry about a power source and when used in an office, the batteries could be conserved. Several recorders are available which operate on both AC and battery. However, at this writing there are none which also incorporate many of the other highly desirable features previously described.

Weight From a production standpoint it is probably a physical impossibility to design a recorder to meet the specifications of our "ideal recorder" and hold its weight to 30 pounds. We said at the outset, however, that we knew of no machine which could fill the bill in all respects.

Weight is, nevertheless, a significant consideration in selecting a recorder if it is to be used for field work. Have pity on the man who gets the field assignment. Thirty or thirty-five pounds doesn't sound like much—unless you've been the one

who had to carry it in and out of office buildings all day. If a recorder is being bought for the prime purpose of using it in the field, buy one in the 20- to 30-pound class—if the rest of the specifications meet your requirements.

Price Nearly everyone would probably like to drive a Cadillac. The fact remains, a lower-price car will do most of the things a Cadillac will, even though it's at a less-luxurious level. The same holds true for recorders: it would be nice to have a studio-quality recorder, but not all of us really need that much quality. So, pick a price range within the budget, then compare the specifications of the various machines in the same bracket.

* * * * *

There are recorders which have additional, desirable features we haven't covered. There are also special purpose units, such as dictating machines, tape players, message repeaters, etc., which have not been included. Our discussion has been limited to the "general-type" portable machines because we felt these would be of most interest to our readers.

In neither this nor in other chapters have we striven to present a technical treatise for the audio engineer or other professionals in the field of audio recording. Instead we have tried only to provide an adequate index and guide which will enable the interested layman to select and buy a portable tape recorder which meets his personal specifications as to performance, capabilities and price.

CHAPTER 12

HOW TO OPERATE A TAPE RECORDER—I—

“YOU PUSH THE button. We do the rest.”

That slogan helped George Eastman become a millionaire, because: 1) it was true, and 2) it encouraged millions of Americans to buy and use Kodak cameras and film.

With slight modification the slogan can be used again today—to apply to tape recorders: “You turn the switch (or push the key), start talking, and the recorder does the rest.” The fact that tape recorders are so simple to operate, with such surprisingly successful results, is responsible for the fact that every day more and more Americans are becoming avid recording enthusiasts.

To operate a recorder and put sound *on* tape you need to be concerned with only three controls:

- 1) on-off
- 2) recording level (volume)
- 3) record operation.

To get the same sound *off* the tape you actually require only one additional control—the “playback” switch or key.

In practice even the lowest priced machines on today’s market utilize several additional controls. They’re all as simple to operate and understand as those just mentioned. These are the

elements to be "controlled" when operating a recorder. The "controls" will either be knobs, buttons or keys.

- 1) Power to the recorder
- 2) Tape speed
- 3) Recording level (volume)
- 4) Playback level
- 5) Magnetizing the tape (recording)
- 6) Playing the tape (playback)
- 7) Tone quality of playback
- 8) Rewinding the tape
- 9) Winding the tape forward (without playing it)

Professional recorders frequently have a separate knob, switch, button or key to control each element individually. In fact, in at least one case *two* controls will be used instead of just one; separate bass and treble controls will be used to replace the single "tone" control. (See page 144 for reasons.)

On non-professional recorders you may find only three different controls to do all nine jobs! This is because each one is designed so that it incorporates several functions. Despite this fact you'll have no trouble deciding what to push, pull, twist or turn, because instructions are lettered above and/or below each control.

Threading the Tape However, before you start manipulating controls, you want to put a tape on the recorder. The first consideration is whether your recorder is designed to use an "A" Wind or "B" Wind tape. On "A" Wind tape the shiny surface of the tape faces the edges of the reel. "B" Wind is the reverse. The great majority of tape used today is "A" Wind. Either wind may be used interchangeably on any machine, however, merely by giving the tape a half-twist as it is threaded through the erase, record and playback section.

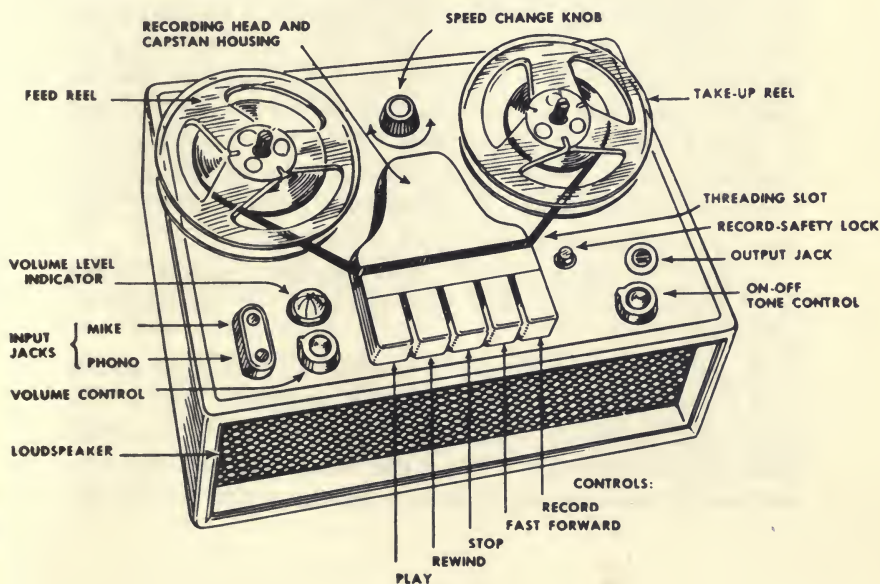
Threading tape (loading it) on a recorder is quite simple. Many of today's recorders feature "slot threading" which is exactly what the name implies. You merely place a full reel of tape on the feed spindle, pull eighteen inches or so of tape from the reel, attach the loose end to the take-up reel and

drop the free tape into the slot. If the tape you're trying to use is wound incorrectly for your recorder you'll find out immediately. Either it won't record at all or you'll get the same effect as when there's a loose tube in a radio. Recorders which don't use "slot" (also called "straight line") threading still won't be difficult to operate. A little common sense plus a glance at the various directional arrows or instructions printed on the recorder, show immediately how to thread the tape.

On conventional recorders, tape threading is so simple that even small children can do it without difficulty. However, some manufacturers have carried the simplification even further and packaged the tape in a cartridge. The only "threading" involved is in inserting the cartridge into a receptacle on the recorder and turning on the machine.

Like everything else, there are both advantages and disadvantages to the presently available cartridges. Editing the cartridge tape is either an impossibility or a difficult, inconvenient process. This means that tape in cartridges is not ideal for use in recording anything which will require editing to

TYPICAL TWO-SPEED TAPE RECORDER WITH PUSH-KEY CONTROLS



make it satisfactory for a specific purpose. Also, "standard" recorders are not usually designed to accommodate a cartridge for recording or playback.

On the credit side of the ledger, cartridges are excellent for any recordings which are of a strictly temporary nature and which require no editing—such as dictation of letters. Cartridges are also useful in recording anything that is to be kept permanently and in its entirety, for example, a high level group of top executives at a policy-making meeting. In addition to the speed with which a cartridge may be inserted or removed from a recorder, it offers the additional advantage of being its own protective and storage case for the tape inside.

With the amazingly rapid progress being made throughout the entire tape recorder industry it is a virtual certainty that the existing disadvantages will soon be overcome and the advantages extended much further. For this reason, cartridges will probably play a much more significant role in the future than they do at present.

An even more recent innovation in the same general area is the "self-threading magazine" of tape. The magazines require no threading, but a special "tape player" is needed to utilize the models presently available. The magazine is inserted in the player and the switch turned to the "play" position. When the tape ends, the switch is turned to the "eject" position and the magazine pops out. No rewinding is involved because the tape is spliced into a continuous loop. These self-threading reels open new vistas of tape application for sales demonstrations, automobile dictation and countless other fields in which "loop tape" and automatic operation are advantageous.

So much for the specialized tape threading systems. Here's what happens to "standard" tape threaded on "conventional" recorders.

To get from the feed reel to the take-up reel, tape travels past what amounts to three separate magnetic "heads"—an erase head, a record head and a playback head. The erase head *always* comes first. This is the reason you can eliminate mistakes by re-recording right over the unwanted section. It's

also why it is disastrous to turn the control switch to "record" when you want to "play back" a recording of something you want to keep permanently. Next in line is the record head and last is the playback head. In actual practice the majority of non-professional recorders use one head for *both* playback and record purposes. Only the more expensive units use three separate heads.

Incidentally, when you "record" a tape you are actually doing nothing more than impressing a varying pattern of magnetization on it. A tape is erased by the simple process of remagnetizing the tape to cancel out the original pattern and leave one that might be classified as "neutral"—i.e., having no magnetic variations which can be detected by the playback head.

Now that we know how to put tape on the recorder and what will happen to it during the process of recording or playback, it is time to return to the nine elements to be controlled, mentioned earlier, and see how the various controls are actually accomplished in practice.

Controls One switch can be used to take care of elements 1, 3 and 4 (page 154)—turn the recorder on and off, and adjust the recording or playback level. On dual-speed recorders there will be a control for pre-setting the tape speed before making a recording or playing back one already made. There may be one multi-purpose knob which allows you to control elements 5, 6, 8, and 9—record-playback, rewind or fast forward. There will usually be a separate control to handle element 7—tone quality of playback.

In all (if you were counting the various controls in the previous paragraph you've already noticed this) there could be as few as three controls and one "adjustment" involved in making a recorder perform any job you desire: a combined on-off and volume control; a combined record or playback control; and a selector which controls tape movement for record or play, rewind or fast (non-play) forward; and an adjustment for tape speed.

Of all the controls mentioned, if there's one which should be more thoroughly understood than the others, it's the "volume" control.

Volume Control Except on studio-type professional recorders the same volume control usually controls both recording and playback volume. *Unless you record with the volume control set correctly there's nothing you can do later to get high quality sound off of that tape on playback.* The significance of this fact is completely relative; if the fidelity of the sound you're recording is important in playback, then so is your handling of the volume control at the time you make the recording. If the fidelity of recorder sound isn't critical—and you're just interested in "intelligible sounds" coming off the tape on playback—then your adjustments of the volume control aren't overly critical.

Interestingly enough, a tape recorder is on your side whether you're a critical listener or not. On a comparative basis you'll get much better sound from a tape than you would from a disc or wire recorder with the volume too high or too low.

As mentioned in the previous chapter, every tape recorder has some kind of built-in volume indicator. The indicator may be a single or double bulb or a meter. Here's a general rule of thumb to follow if your recorder has a bulb-type indicator: a single bulb should flash on and off throughout a recording. If it stays lit continually your recording level is much too high. If it doesn't light at all the level is too low. In either case you'll have trouble on playback. "Magic Eye" bulbs should "close" and open continually. If they close and stay closed, turn down the volume. If they never close, turn it up.

Dual type bulbs provide greater control with less skill. One light should remain on at all times. When the second bulb lights it's time to readjust the volume control.

None of the bulb-type volume indicators light up during playback. There's no need for it. Your ear is the best judge in this case because you know how loud or soft you want the playback.

Meter-type level indicators are entirely different. They are the most accurate type—if you know how to use them correctly. Most meters will continue functioning on both recording and playback. The needle will fluctuate up and down as long as sound is coming in or out of the recorder. As long as the fluctuations take place within the right range there's nothing to worry about. *Don't* keep spinning the volume control in an effort to keep the needle absolutely steady. It's not supposed to be steady. For detailed instructions, consult the instruction manual received with your recorder.

On that subject, this is a good place to point out that manufacturers supply an instruction manual with their recorders for a good reason. Each recorder has operating and functional characteristics which make it unique. Manufacturers are proud of this fact and consider that these particular characteristics make their machines worth buying. Read the manual thoroughly—then keep it around for future reference—and you'll be much more satisfied with the performance of the machine you own.

Input and Output Jacks Up to this point we haven't mentioned anything about the various input and output jacks you'll find on your recorder. There will be at least three jacks—two input and one output.

When you unpacked your machine there was probably a microphone with it. At the end of the microphone cord there is a male plug. Unfortunately this plug will probably fit into more than one of the female jacks on the recorder. If you plug the mike into the wrong jack, one of two things will happen; either you'll get no recording at all or else one you wished you hadn't.

One jack will be labeled "Radio," or "Radio-Phono." Another one will be labeled "Mike" or "Microphone." They mean what they say. Because of an electronic phenomenon called *impedance* the circuitry behind each female jack is slightly different.

A microphone has a certain impedance, so does a radio or phonograph output. The two are not necessarily the same.

When you connect two circuits of matching impedance (insert a plug into a jack) the results are rewarding. When impedances are mismatched all sorts of things happen; none of them are good. The reasons are technical and involved but in a sense you have the same type of problem you get by connecting a two-inch garden hose to a one-inch hose. The amount of water that is "right" for the two-inch hose is not right for the smaller one, and vice versa. The significant point to remember is that it is essential to insert the right plug into the appropriate jack.

If you should ever want to use a microphone other than the one received with your recorder, be sure to test it before you begin the actual recording. Different microphones have different impedances.

Most microphones that come with semi-professional or home-type recorders have what is classified as "high impedance." Professional microphones are usually designed to operate at "low impedance," but can be adjusted for higher impedances. Any microphone you use must match the impedance of your recorder's microphone input circuit. (Remember the hoses).

In all probability, the microphone you receive will be a crystal microphone. Don't feel that you have to hold it between your teeth to get sound through it. Crystal mikes are very sensitive (i.e. they have tremendous sound-pick-up capabilities). For voice recording try to keep the microphone at least 12 inches from your mouth. When possible have the mike sitting on a table or something else that is solid, instead of holding it in your hand. Try to position the mike so that you can keep the recorder's volume *control* somewhere around its middle setting—and still get the required reactions from the volume *indicator*.

Here's another tip on using a microphone. Turn off the recorder's built-in speaker before you start recording. If you don't, you're likely to get "feedback." Feedback can be described as an electrical "sound circle,"—i.e. sound goes into a mike, works its way to the speaker, comes out of the speaker and goes back into the mike. Feedback announces its presence

by making a loud squeal come out of your speaker. No additional explanation is needed; if you have feedback, you'll know it—immediately. If the speaker must remain on when you're recording through a mike, position the mike somewhere *behind* the speaker, and speak in the same direction the speaker itself faces.

To use the "Radio-Phono" jack you'll need a "patch cord." A patch cord is nothing more than a wire with a plug at one end and some alligator clips at the other. The alligator clips are attached to the two metal lugs that protrude from the back of the speaker on your radio or phonograph. The plug is inserted in the jack in the recorder.

Your recorder will probably have at least one output jack. It will be labeled "Spkr" or "External Speaker." The purpose of this jack is to allow you to hear your recording played back on a larger—and usually better—speaker than the one built into your recorder. To use this jack you'll need a patch cord again. If you use the same type as the one described above you can use a speaker that isn't even connected to any power source—other than your cord.

This speaker jack offers another possibility. Suppose you want to playback your tape for a very large audience in an auditorium. An external speaker isn't enough; you haven't got sufficient power going into the speaker. In this case you can plug your patch cord into an external amplifier which, in turn, feeds its output to a speaker. Once again you've got to watch impedances. The amplifier's input impedance must match the recorder's output impedance.

Repairs There are only two things to consider relative to repairs for your recorder—when they're needed and where to have them done.

After reading the preceding sentence you're probably saying to yourself, "We hold these truths to be self-evident—why waste time on them here?", or something similar. The reply is, yes, they are self-evident. But—a tape recorder being the unique instrument it is, the original statement is not as innocuous as it seems on first reading.

There is frequently more to consider in determining *when* repairs are needed than there is in *where* to have them done. For that reason we'll discuss the "where's" first.

A tape recorder is not the same thing as a radio—despite the fact that many "home" recorders have built-in radios. Without detracting in the least from the skills and abilities of the average radio repair technician, he is not necessarily the best one to overhaul your recorder. Basically, the electronic principles of a recorder are the same as those of a radio. But a recorder has a number of components never found in any self-respecting "wireless." These include such parts as capstans, pulleys, flywheels, magnets, etc.

When the mechanical components of a recorder are not functioning correctly, the world's most thorough electronic repair job will *not* put the recorder back into A-1 condition. Reputable, competent radio technicians know this, but unfortunately many of them don't have the training necessary to do anything about it. Special training and skills are needed to do a comprehensive repair job on a tape recorder. For this reason all the major recorder manufacturers establish "authorized service stations" throughout the country. The manufacturers strongly recommend that you have their equipment serviced only at these stations. Strangely enough this is not a diabolical scheme on their part to snare you into a type of financial slavery where you buy only their products and patronize only fellow members of an insidious conspiracy.

There are important functional and design differences not only between a radio or TV set and a tape recorder, but also between recorders made by different manufacturers. You don't buy a new Jaguar and then take it to a motor boat agency for repairs. The same principle applies to tape recorders. Each manufacturer "authorizes" a repair station to represent the company *only* after the technicians have either been specially trained by the factory or have adequately proven by demonstration that they are competent in the repair of that particular manufacturer's product.

Some recorder repair stations will be "authorized" by more than one manufacturer, while others—either through their own

choosing or because of manufacturer's restrictions—will handle only one make of machine. In either case your recorder will be safe in their hands. The problem of locating such service stations is no problem at all. The majority of big manufacturers publish a list of such stations and either include it with the original instruction material which accompanies the new recorder or else they will readily send it on a request from you. If you don't have such a list, and you're interested in continued top performance from your recorder, it is well worth a two-cent postcard and a moment of your time to send for one.

Recognizing *when* your recorder needs service is—or can be—difficult. Much of the problem is of a personal nature and rests directly with you. If your recorder is used primarily for professional or semi-professional purposes your daily use of it will qualify you to detect its servicing needs much sooner and more accurately than if you use it only periodically for strictly personal purposes.

The type of repairs we're considering at this point are not the obvious ones such as a unit that "won't play" or "won't record" or one on which "the tape won't move." We're talking about the servicing that is needed when the tape speed varies *slightly* (causing an impaired frequency response or "wow" and "flutter") or when the slit in the playback or record head gets worn.

If your use of the recorder demands that it deliver maximum performance in all respects, at all times, deficiencies of this type are significant. It is to your advantage to detect them as soon as possible and have them corrected immediately.

One way to insure maximum performance and long life of the recorder is to have it serviced periodically on a regular schedule, just as you have your car serviced every so often. The instructions which came with the recorder probably contain a recommended service schedule, based on the number of hours of operation. Following this schedule of preventive maintenance will help considerably in eliminating the repairs (and high costs) involved in a sudden major breakdown.

No specifications for recommended servicings are included here because different manufacturers make different recom-

mentations for their own machines. Although we can't tell you exactly when to have your recorder serviced, we can offer suggestions for testing it to determine if servicing is needed and to detect wear.

The first and least expensive—and *least accurate*—method is to play on your machine a tape made on another machine. This sort of test can be relied on only for the detection of the most obvious of defects. The reason is that you can't be positive that the test recorder is in perfect condition itself. You may have experienced an example of this yourself. You put a tape which sounds perfect on your recorder on someone else's machine. It doesn't "sound" right; the brilliance of the original tone is lacking or the volume seems to fluctuate. The trouble *might* not be with your machine—but with the test recorder instead.

An extremely critical relationship exists between the recording and playback head and the tape which rolls past the head. Consequently, unless the relationship is absolutely identical on both the test machine and the one on which the tape was originally recorded, any given tape will be distorted on one machine or the other. The remedy, of course, is to make certain that the head alignment (and, actually, a number of other elements) of the playback machine is identical to that of the machine on which the tape was recorded.

So, if it is a matter of dire necessity, and you have no other alternative, test the tapes made on a suspect recorder on another one that is fairly certain of being in perfect condition. And, a point to remember is that the newness of a machine is not necessarily an absolute guarantee that everything is perfectly adjusted, although the odds are good that it is.

A much better method of "home testing" a recorder is to use pre-recorded tapes made especially for this purpose. It is possible to buy a "test tape" which tests a recorder for such elements as wow and flutter, head azimuth alignment, frequency response, signal to noise ratio, signal level and tape speed. Periodic playing of such tapes on your recorder will notify you immediately of any decrease in performance standards.

The last method of testing a recorder actually amounts to a minor servicing by a professional technician. Instead of having

a complete overhaul, however, you take the recorder to the repair shop and specify that it be checked only for certain functions. The technician has the various meters and other testing devices to isolate particular circuits and can frequently make these minor checks without undertaking a costly, top-to-bottom repair job. However, unless you are either quite familiar with your machine or else are somewhat of a technician yourself, if you get this far in the checking of your recorder, the technician will probably convince you that it is wiser to go ahead and check the whole unit. He may be right.

This chapter could continue indefinitely and still not cover all the possible situations you will eventually face in the mechanics of operating your recorder. That's where the instruction manual re-enters the picture—and that's where you should begin your own experimenting. From what you know after reading this chapter, you're ready for experimentation. You've got the fundamentals.

CHAPTER 13

ACCESSORIES AND HOW TO USE THEM

ACCESSORIES FOR use with tape recorders are about as numerous as spots on a pedigreed Dalmatian. Some accessories will definitely increase the flexibility of your recorder and improve the quality of the end product. Others fall into the class of "nice to have if you can afford them." At the moment, accessories are appearing on the market almost as fast as a linotyper can set the type to describe them.

The list in this chapter doesn't include every last accessory available on today's market, but it does contain those which we believe would be of practical value to the businessman who uses his recorder for business purposes.

Microphones Auxiliary microphones—with the right impedance for your recorder, naturally—greatly increase the recorder's utility. For example, in lecturing or whenever the speaker needs or desires to move around, lapel or chest microphones are ideal. Additional microphones and a mixer (see below) also allow the simultaneous recording—on the same tape at the same time—of sound from several different sources.

There are six basic types of microphones:

- 1) crystal
- 2) variable reluctance
- 3) ceramic
- 4) dynamic
- 5) ribbon—also called “velocity”
- 6) condenser

Today most non-professional recorders come equipped with a crystal, variable reluctance or ceramic microphone.

Basically a mike is nothing more than a device to convert and transfer one type of power to another type—acoustic power to electrical power. Sound is actually a series of waves of air, moving at different frequencies and with different intensities. A microphone reacts to these air waves and, in the process, produces electrical energy in the form of voltage.

Crystal microphones generate this voltage because the sound waves deform the molecular structure of a crystal. These mikes have a general frequency range of about 100 to 8000 cycles per second—the range of the human voice. They are actually more “sensitive” (can pick up weaker sounds at greater distances) than most so-called “professional” microphones which cost much more money.

Crystal mikes have their drawbacks: they’re easily damaged by heat—122 degrees F. is enough to do permanent damage; humidity changes their frequency characteristics (so you should *never* blow into a crystal mike to see if it’s “on”—just flick your fingers over the face of it or tap on it gently); their frequency response is relatively inconsistent; and, of course, they’re relatively susceptible to shock—for proof, just try dropping one on the floor in the shipping department.

Variable reluctance microphones convert sound waves into voltage through the movement of an armature in a magnetic field created by a coil of wire which is carrying a current. This type of mike has a slightly narrower frequency range than a crystal mike, but its frequency response (the upper and lower frequencies it will register) is more consistent.

This type of mike is not affected by temperature or humidity (but it’s still not a good idea to blow into them), can withstand considerable shock and—because of a peculiar physical

phenomenon—gives the illusion of a better low frequency response.

Ceramic microphones are a relatively new entry in the field of home recorders. Their frequency range is in the same general bracket as a crystal mike, but reduced at the high end. They are not as sensitive as either the crystal or the variable reluctance mikes but are relatively rugged and insensitive to humidity or temperature.

Dynamic microphones generate a voltage as a result of a conductor (a current-carrying coil of wire) moving in a magnetic field. Mikes of this type are used in professional and semi-professional work. They are rugged in construction and design and not adversely affected by temperature or humidity. An average frequency range for this type of mike would be in the order of 60 to 13,000 cycles per second.

Ribbon (velocity) microphones operate on an entirely different principle than the mikes previously described. The difference in the *pressure* of the sound waves on either side of the ribbon causes the ribbon to vibrate, producing an electrical current.

Mikes of this type are definitely in the professional class—and so is their price. Their recording characteristics are superb—frequency ranges from 30 to well above 15,000 cycles per second are common for better-quality ribbon microphones. Although this mike is not affected by temperature or humidity it is extremely vulnerable to damage by shock or wind—breathing, sneezing or coughing directly into this mike is definitely not advised.

Condenser microphones function on the same principle that allows you to get different stations on a radio. The diaphragm is moved back and forth by the sound waves, changing the electrical characteristics of the condenser, thereby generating the necessary current. In general, this type of mike is in the same class as a dynamic microphone.

Before leaving the subject of microphones as an accessory for your recorder, one more fact should be mentioned: there's no point in buying a mike which can out-perform your recorder. You couldn't put a Rolls Royce motor in a Model-T

Ford—without making extensive alterations—and get good results. The same applies to high-quality microphones. They won't do you any good when used with a recorder that wasn't designed to function with them—unless you modify the recorder's circuitry.

Extension Cords *Auxiliary power cords* are useful for permitting recorder operation in locations that are remote from an electrical outlet. Most recorders come equipped with power cords five or six feet long. For operating convenience, however, it is frequently desirable to set up the recorder more than six feet from an outlet. Conventional, rubber-covered “lamp cord” extensions—available at any hardware and almost all “variety” stores—solve the problem nicely.

These cords are available in the standard sizes of six, ten, fifteen and twenty-five feet. To eliminate the necessity of buying—and storing (which is frequently more of a problem than it might seem)—a number of different extension cords, it is recommended that one 25-foot cord be purchased. A 25-foot cord can always be left “coiled down” to six or ten feet if the total length isn't needed.

Anytime it becomes necessary to use more than 25 feet of power cord extension it would be wise to forget about lamp cord. Lamp cord wire is relatively “thin.” This means its electrical “resistance” gets uncomfortably high when extremely long pieces are used to conduct standard 110-volt current from the outlet to your recorder. High resistance to 110-volt current causes the wires to get hot. Leaving an excessively-long lamp cord extension plugged into an outlet long enough may result in one of two consequences—either you're going to blow a fuse or start a fire, neither of which is recommended in the interests of high-quality recordings or peace of mind.

The solution to this problem is quite simple. Instead of lamp cord, you buy a 100-foot coil of #16 extension cord. It will cost roughly in the neighborhood of six-and-a-half to seven dollars. With #16 wire you can operate your recorder anywhere (within a radius of 100 feet of the outlet, of course) anytime, for as long as you desire.

Microphone extension cables are desirable for the same reasons as power cord extensions. The cable on the mike which came with your recorder will probably be anywhere from four to six feet long. If you plan to record "roving interviews" or the proceedings of a large-scale conference, you'll either have to have a microphone extension cable, additional microphones—and mike mixers to go with them—or ask people to shout. Mike extension cables are the simplest solution.

Once again the maximum length of the extension is important—and for reasons which are similar to, but not the same as those relative to the power cord extensions. The similarity lies in the fact that too-long an extension results in undesirable consequences. In this case, however, you don't blow fuses or start fires; you merely end up with distorted sound. The blame for the distortion can be laid right in the lap of a previously described electronic bugaboo—impedance.

Any wire used to conduct electrical currents has a certain amount of electrical resistance, and when they're conducting electricity, all wires have impedance. Because of its function, the impedance of a power cord isn't important but its resistance is. The reverse is true of a mike cable. The longer the mike cable the more trouble there is with impedance.

Twenty-five feet is a safe maximum length for a mike extension cable when that mike is used with the average portable tape recorder. With this length as a maximum you are virtually sure of trouble-free operation. With cables over this length you may possibly be headed for troubles. The circuitry of your recorder is the key factor. Of course, it is possible to make modifications in the circuitry—or to use special devices in the mike cable itself—to overcome the problems. Such modifications are relatively technical in nature and would involve complicated explanations. Consequently, if you consider it absolutely imperative to use a super-king size mike cable extension, the best course of action would be to consult an audio technician.

Microphone cable extensions don't look anything like a power cord extension. In the first place they are usually connected directly to the mike plug, so that the "extension" is

actually the cable itself. In the second place, mike cables are much smaller in diameter than a power cord. Once again it is recommended that you go the limit if you decide to buy an extension—get one that is 25 feet long.

Cables for microphones are of two basic types—single-conductor and double-conductor. Naturally—as in every other instance where there is more than one method or item available to do the same job—there are two, equally vocal, schools of thought as to which is best. Cold facts are that either type will do the job adequately. The single-conductor cable has a single strand of wire encased in a special covering of insulation. The insulation contains the other “wire” needed to complete an electrical circuit. The two-conductor cable has the same physical appearance as the common ordinary wires used on home lighting fixtures.

The type of cable you choose for your mike extension is not important, as long as you remember one salient point—it must be microphone cable; “ordinary” wire won’t do.

Reels Reels are listed here as an accessory because if a tape recorder is ever used for any purpose other than fun and foolishness, more than one empty reel is an absolute necessity.

Without at least a few empty reels on hand it is almost impossible to edit a tape once a recording is completed. Also, if only part of a reel is used for a recording that is to be saved for any length of time, it is sheer waste to leave the unused tape on the original reel. It can be cut off, wound onto an auxiliary reel and kept ready for use on some other project.

Reels come in assorted sizes and materials. There’s a purpose and use for each. When you bought your recorder you probably received one empty reel—either a five- or seven-inch plastic reel. It is almost impossible to “wear out” a plastic reel, but you can ruin one, by exposure to high temperatures or by stepping on it. High temperatures—such as direct sunlight streaming in through the rear window of an automobile—can warp a plastic reel.

A badly warped reel may cause recording troubles. If it

"binds" during winding or unwinding, there will be undue tension on the tape. The stress probably won't be sufficient to cause tape breakage, but it could cause distortion of sound by causing an unsteadiness of tape movement past the recording or playback head.

Reels are available in sizes anywhere from three inches in diameter on up to 14". The specific sizes are three, four, five, seven, ten-and-a-half and fourteen inches. Up to 10½" the reels are plastic. Above that size they are usually aluminum. The majority of readers will seldom use the 10½ and 14 inch reels as they are intended specifically for professional use on recorders designed to accommodate them.

These professional reels usually carry an "NARTB" identification. This means not only that they are different in design and construction from the smaller, plastic reels, but also that they conform to certain standard specifications established by the National Association of Radio and Television Broadcasters. Because of their construction, an NARTB reel and hub will not fit on the average portable unless some type of adapter is used to accommodate the special reel.

The number of feet of tape which any given reel will accommodate is based solely on the *thickness* of the tape itself. The number of minutes of playing time that can be obtained from a given length of tape is based solely on the *speed* at which tape passes through the recorder. The following section contains a further explanation of these facts and a chart showing how many feet will fit on a particular reel, as well as the playing time of that reel at various tape speeds.

Recording Tape For the user there are six basic characteristics of recording tape which are significant:

- 1) type of base
- 2) base thickness
- 3) length
- 4) wind
- 5) width
- 6) color

Type of Base The base is the non-magnetic substance on which the particles of iron oxide (the "active ingredient"—insofar as your recorder is concerned) are coated. There are two general types of base—paper and plastic. Paper-base tape is rapidly becoming a thing of the past. Plastic base tape seems to be here to stay—at least for a while.

The two most prevalent types of plastic in common use today are *cellulose acetate* and *polyester film*. Advocates of polyester-base tape claim it is superior because it won't tear, but stretches instead, and because it has a higher tensile strength than cellulose acetate. From the opposing camp the supporters shout back that cellulose acetate is better because it does tear *instead* of stretching and thereby prevents the loss of high frequency response which occurs when tape stretches.

Confusing? Here's the answer: the "advocates," in both cases, are the respective manufacturers of the two types of tape. From the standpoint of the user—and buyer—the argument is somewhat academic. *Both* types of tape are capable of delivering far more in the way of frequency response, storage life, temperature and humidity resistance, and magnetic permanence than the average user will ever want, try, or need to get from them. Feel safe in buying either type—for any and all uses.

Base Thickness This is significant for the same reason that LP records were significant in the field of disc recordings when they first made their appearance. The thinner the base the more tape you can get on a reel of a given size. Today, tape sizes run all the way from a slim 1-mil, way up to a corpulent 2-mil thickness. The "standard" thickness is $1\frac{1}{2}$ -mils. Believe it or not, the difference of a $\frac{1}{2}$ -mil thickness increases the playing time of a 7-inch reel from 30 to 45 minutes on a recorder operating at a tape speed of $7\frac{1}{2}$ inches per second.

Length Most readers will never be concerned with the data listed for the 10½ and the 14 inch reels, but to make the record complete we've included these two sizes anyhow. Omissions in any of the columns indicate that convenient

REEL, TAPE LENGTH, THICKNESS, PLAYING TIME, RELATIONSHIPS

Reel Size in Inches	Tape Length (in feet) 1½-mil thickness	Tape Length (in feet) 1-mil thickness	Recording Time—Single Track (Tape speeds in inches per second) 1-mil thickness				
			15/16	1%	3¼	7½	15
3	150	225	32 min.	16 min.	8 min.	4 min.	2 min.
4	300		1 hour 4 min.	32 min.	16 min.	8 min.	4 min.
5	600	900	2 hours 8 min.	1 hour 4 min.	32 min.	16 min.	8 min.
7	1200	1800	4 hours 16 min.	2 hours 8 min.	1 hour 4 min.	32 min.	16 min.
10½	2500	3600	8 hours 48 min.	4 hours 24 min.	2 hours 12 min.	1 hour 6 min.	33 min.
14	5000		17 hours 44 min.	8 hours 52 min.	4 hours 26 min.	2 hours 13 min.	1 hour 6 min.

Recording Time—Single Track
(Tape speeds in inches per second)
1-mil thickness

Recording Time—Single Track
(Tape speeds in inches per second)
1½-mil thickness

Tape
Length
(in feet)
1-mil
thickness

Tape
Length
(in feet)
1½-mil
thickness

Reel Size
in
Inches

sources of supply for that particular type and length of tape either didn't exist or were unknown to the authors at the time of this writing.

Wind Tapes are wound either with the coated side toward the center or the coated side out. When the coated side is toward the center of the reel the tape is said to be an "A-wind" ("wind" rhymes with "kind") tape. Tape with the coated side facing outward is "B-wind" tape. A-wind tape is the type in most general use today.

Either type of wind can be used on any machine, merely by giving the tape a half-twist as it is threaded over the heads.

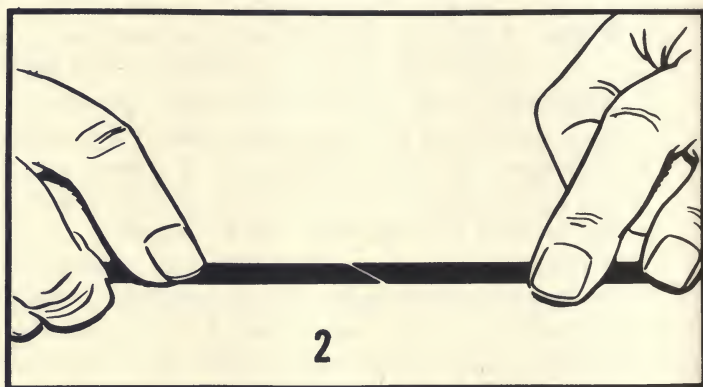
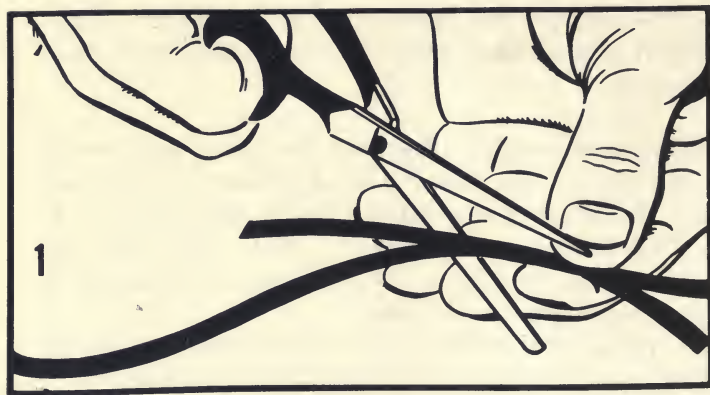
Width Until very recently, all tape was one-quarter of an inch wide. Now it is possible to buy tape that is an eighth of an inch wide. This tape will operate on many half-track and all full track recorders without any special auxiliary equipment. Its main advantage is, of course, you don't waste any tape recorded on a dual track machine if you record only one track so that the tape may be edited.

The main advantage—other than tape economy—of this narrow tape is conservation of storage space. A disadvantage is that editing becomes somewhat of a chore for the individual who has more than his normal share of thumbs on each hand. (See page 189, the section headed "Tape Slitter" for additional information.)

Color Recording tapes are now available in a number of different colors. Different-colored tapes can be used for coding various recordings as to the speed at which they were recorded, whether they are full or half track, etc.

Splicing and Editing Tape For anyone who uses a tape recorder for business or professional purposes, splicing tape is almost as essential as a microphone.

This tape is coated with a hard adhesive which won't ooze or slip under normal tension. For editing or repairing torn



Editing tape is a very simple operation—but doing it properly will help to eliminate potential headaches. No special equipment—other than a pair of scissors and a roll of splicing tape—is necessary. Here's how it's done:

(1) Overlap the two ends to be spliced, making sure that the same side of the tape is facing up on both ends. Holding the tape firmly between the thumb and a finger, cut both ends simultaneously at a 60° angle. (This eliminates detection of splice on recording.)

(2) Lay the two ends on any hard, smooth surface and manipulate until the two diagonal cuts fit together with the uncoated side up. (The uncoated side is shiny on plastic tape, tan on paper tape.)



(3) Holding the two aligned ends in position with two fingers of one hand, apply a piece of splicing tape, evenly and securely. Always use the special splicing tape made for this purpose, although, in an emergency, any kind of flexible, adhesive-backed tape will work.

(4) Trim off excess splicing tape, cutting into recording tape very slightly as indicated to eliminate possibility of a sticky splice.

tape it is essential. Ordinary cellophane tape should never be used as a substitute because it will eventually leave a residue of gum deposited on the recording head of the machine.

A well-made splice is almost impossible to detect when it passes over the playback head of a recorder. A poorly made splice identifies itself by a noise which sounds like a thump. A splice is a good one when the two ends of tape are joined absolutely perfectly, with neither any overlap or any gaps. Overlaps of tape will cause the thump mentioned above. Gaps between the ends of a spliced section will cause a period of absolute silence for the interval of time it takes for the poor splice to pass the recording or playback head.

Here's how to splice a tear in the tape. On a flat surface, twist *both* ends of the tape so that the coated side is toward the table. Use the middle finger of each hand to guide the two pieces into *perfect* contact and alignment, touching each other at every point but not overlapping. When this is done, use the index finger of one hand to hold the opposite piece of tape from the one being held by the middle finger of the *same* hand. Then, with your now-free hand, tear a piece of splicing tape off the special dispenser on which it is wound, and place the tape over the center of the juncture of the two sections of recording tape. With your free hand, gently press the splicing tape into full and complete contact with all of the recording tape it will cover *before* removing the hand which is holding the two pieces in contact. When the splicing tape is firmly in place you can remove the hand which was holding the tape on the flat surface. The spliced recording tape is then "peeled" off the flat surface by gently pulling one end first upward and then straight backward, along the length of the recording tape. The job is finished when you take a scissors and snip off any of the splicing tape which protrudes—and some *should* be protruding, up to this point—over the edges of the recording tape. When doing the cutting, always cut *slightly* into the recording tape itself so that the finished splice will be somewhat narrower than the tape on either side of it.

The procedure is much the same in general editing. The main difference is that scissors are used to cut the edges to be

joined. The two pieces to be spliced should be placed directly on top of one another and overlapped about an inch or an inch-and-a-half. With the scissors, cut both pieces of tape simultaneously—at an angle of approximately 45 degrees. From this point on, the splicing procedure is identical to the one described above.

The accompanying diagrams and sketches serve as further illustrations of the actual mechanics of the splicing process. With practice, good splices can be made in a matter of seconds. Don't be discouraged if your first few splices don't turn out the way you feel they should. After a little practice they will be perfect—every time.

The accessories discussed up to this point were considered to be of such vital importance that they were listed in that order. The following items are important too—but not to the same degree as the preceding. So, from this point on, the accessories are arranged in *alphabetical* sequence, to aid the reader in locating them rapidly, should he desire to do so.

Amplifiers An amplifier is an electronic unit which works in conjunction with but in addition to any internal amplifier your recorder may have. Practical, adequate amplifiers are available in a 20 to 30 dollar price bracket. Models designed for "the carriage trade" carry price tags with three digits before the decimal point. The economy-minded, handyman type of individual can save money and have fun by purchasing a "kit" and building his own amplifier. The best place to look for amplifiers or kits is an electronic supply house or a "hi fi" music center.

Auxiliary amplifiers are essential if you want to power the large speakers needed when you play tapes for public address purposes. You merely connect the recorder's speaker output to the amplifier input, which, in turn, is connected to the Public Address speakers.

Boxes Whenever recordings are made in quantity there will always be cases where only part of a reel is used. Instead of leaving long sections of unrecorded tape on a reel it

is common practice to remove the excess footage and wind it on another reel. This makes the tape ready for instant use. Until used, this tape should be kept in boxes so that it doesn't get lost or damaged.

Bulk Erasers If time or quantity are factors in tape usage, a bulk eraser is a necessity. Instead of running a tape through a recorder with the selector in the "erase" position, a bulk eraser is used to "clear" the entire reel in one operation requiring only 25 to 30 seconds! Using a recorder to erase a 1200 foot tape would require at least 15 minutes!

Clock Timers Operating on the same principle as a "clock radio," these timers turn an unattended recorder on and off at a specific time. They are particularly useful for playing a pre-recorded "message" (commercial or otherwise) at an appropriate time—a good example being an employee "information program" piped into the lunchroom at noon.

Colored Recording Tape This was touched upon briefly, earlier, in the section on recording tape. To code or identify various recordings, many business organizations using large quantities of tape are resorting to colored tape. One color indicates a recording speed of $7\frac{1}{2}$ inches per second; another color indicates $3\frac{3}{4}$ ips. A different color would indicate full track recordings, while still another identifies dual-track.

Another method of using colored tape is to use different colors to classify the type of content *on* the tape; e.g., green tape would contain motivational messages for branch salesmen; blue tapes would contain price or product information, etc.

Continuous Playbacks Attachments which repeat-play a tape over and over are useful in point-of-purchase advertising or internal public relations. A number of different devices are available which allow either

continuous or periodic repetition of a tape. These devices can be actuated either by an external means—such as an electric eye or a pressure control concealed in a floor mat—or on an automatic time control.

Earphones For monitoring (listening during recording or playback) earphones are ideal. Earphones come in assorted sizes, shapes and varieties—with at least one type to please anyone's taste—and pocketbook. First, there's the "ear-muff" type. The nomenclature being used in this case is *not* necessarily the "professional" nomenclature which you will find in parts manuals published by manufacturers or supply houses. We're trying to be as descriptive as possible, however, and for the reader whose background in the audio industry is skimpy we thought this might help. Ear-muff headphones look just like what the name implies; either one or two pieces of wire or plastic fit over the head, holding the phones in position over the ears.

A modification of this type is the single headphone—a one-eared ear-muff. Also available are "hearing aid" type phones. These have a "hook" (similar in appearance to the hook on a clothes hanger) which slips over one ear and hold the phone in contact with the ear.

Another version is the "stethoscope" variety. This type looks something like a "wishbone" from a turkey or chicken. Small plastic plugs fit *into* the ear, just the same as the plugs on the end of a doctor's stethoscope. A modification of this type of phone is the "dictation machine" type, which either has an ear hook or a slim headband to hold the plug firmly but gently in one ear. Still another version of this basic variety is one that was probably designed by a phrenologist; nothing touches the ears! The receivers rest lightly on the temples and tubular sound arms pipe the incoming sounds to your ears.

If none of the headphones previously described strike your fancy there's only one thing left to say—buy a pillow speaker. A pillow speaker is an "earphone" designed for use in bed. Its flat construction makes it convenient to place under or at the edge of the pillow. All night long, or for the duration of your

tape, you can sleep peacefully(?) and still listen to music, musings or messages from the boss. This isn't as facetious as it sounds; a growing group of advocates—both formal academicians and personnel managers responsible for training—is using this technique for training purposes. They claim that learning processes are speeded up when the subconscious mind is in complete control of the thought processes.

A word of warning—before buying any of these earphones, make sure they're "right" for your recorder. What makes them "right"? You guessed it, *impedance*.

Here are some practical uses of earphones. Secretaries can use them when transcribing dictation from tape in an office. The recorder's speaker can be turned off and the secretary will then be the only one to hear the tape. The advantage is obvious; no one else in the vicinity will be disturbed by the sounds coming off the tape, and the secretary won't be distracted by the sounds around her because all she will hear is what is being piped directly into her ear.

Earphones are also useful during the making of a recording. They provide the operator with an *immediate* check of what is actually going on the tape; he doesn't have to wait until the recording session ends to discover any defects or malfunctioning of his equipment.

Foot Switch Not all recorders are designed to operate from a foot control. For those which are, a foot switch to start and stop the recorder further increases its operating flexibility. For instance, transcription of data from tape to the typewritten page becomes easier because the typists' hands are left completely free for typing.

Head Demagnetizer Strangely enough, magnetic recording heads should not, themselves, be magnetized. Their purpose is to *do* the magnetizing, not become magnetized. Unfortunately, after a certain amount of use, heads will become permanently magnetized. In this condition they affect the fidelity and quality of sound.

Professional recordists demagnetize recording heads after

every four to eight hours of use. For general recording it is not necessary to demagnetize the head this often. The demagnetizing can be done when the recorder is taken in for its periodic servicings. Where fidelity of sound is of utmost importance, however, the heads should be demagnetized before the recording begins.

Inverter This device, also called a "converter," changes battery current and voltage to "household" current and voltage. With it you can operate a 100-volt tape recorder in your car, boat or airplane. If you decide to install an inverter in any of these vehicles, but prefer to operate your recorder only in the office or at home, you still haven't lost any money. An inverter can also be used to power such useful implements as vacuum cleaners, electric comptometers, lights, electric shavers and electric drills.

Labeling Tape As the name implies, labeling tape is used to indicate and identify the content of a recorded tape. It is a pressure-sensitive, non-magnetic tape which can be written on with pencil, pen, ball point pen or typewriter. It greatly facilitates filing when a large quantity of tape is involved. Not only is it good for use on the boxes or cartons which hold recorded tapes, but small strips of it can be used on the reels themselves, to locate and identify the start and end of particular segments of a complete recording.

Mailing Cartons These specially constructed, strong, corrugated, reusable cardboard cases protect tapes sent through the mails. Companies which have an organized tape program involving the scheduled mailing of tapes to agents throughout the country, use these boxes to protect the reels from damage and to speed up the packaging and wrapping procedure.

Mixer An electronic mixer is a device containing a number of different input jacks and one output. Its purpose is to combine the separate inputs into a consolidated output.

Here's an example: suppose you wanted to make a recording of the sounds being picked up by three microphones being operated simultaneously. Such a situation might arise at a conference or meeting involving a large number of people. The group is too large for everyone to gather around one mike, so more than one mike must be used.

The *output* from each *mike* is plugged into a separate input jack on the *mixer*. The mixer then combines each separate input into one *combined output*, which is then fed into the tape recorder. This means that anything going into *any* of the microphones at *any* time, will end up on tape. If two people talk into *different* microphones at the same time, they'll be talking at the same time on the tape. If one person is speaking more loudly than the other, that's the way it will sound on tape —*unless* the mixer is adjusted accordingly. On many mixers there is a volume control for each input jack. Adjustment of this control can quiet down a loud voice or increase the volume of a quiet voice.

The use of a mixer is not restricted to microphone inputs alone. A mixer may be used to combine a microphone input with a phonograph or radio input, also. In other words, the function of a mixer is to mix different sounds, from different sources, into one source which is then recorded on tape.

Mixers, like amplifiers, can be purchased either "ready made" or in kit form. Some would fit in your pocket; others would just barely fit on top of an executive-size office desk. Prices start in the three- to four-dollar range and then move up into the two- and three-digit classification. A quite versatile, adequate, good-quality mixer can be purchased for between 30 and 40 dollars. One of this type will accommodate four or more different inputs and provide near-professional quality and operating convenience. For average use the mixers in the 10- to 15-dollar bracket are more than acceptable.

Patch Cords These are cords with a plug at both ends or a plug on one end and alligator clips on the other. They are used to convey electronic signals from one

circuit—or physical unit—to another. For example, a patch cord would be used to record the speaker output of a radio or phonograph by the recording method known as “direct electronic pickup.”

An electronic pickup means that instead of using audible sounds to make a recording, the *electrical impulses*, which make up those sounds, are used. In the case of an electronic pickup of a radio or phonograph speaker output, one end of a patch cord is connected to the speaker leads (rhymes with deeds) and the other to the input jack of the recorder. This eliminates the necessity for having to use a microphone to re-convert a speaker's *audible* sound output *back* to an electrical impulse so that it can be recorded on tape. Elimination of this intermediate process will give the finished recording better fidelity and sound quality.

Another use for a patch cord would be to connect a recorder's output to an external amplifier. It could also be used to transfer the output of one tape recorder to the input of another recorder.

Reel Adapters Some recorders will accommodate adapters which allow the use of larger reels of tape than those which are standard for that particular machine. For instance, assume that the basic design of your recorder allows the use of a reel with a maximum size of seven inches in diameter. If adapters can be used—or are available for your machine—it might be able to accommodate reels up to 14 inches in diameter. Naturally this increases the maximum, continuous recording or playback time of the unit, because 10½- or 14-inch reels hold much more tape than a 7-inch reel.

Speakers It would be simple to extend this section into a book-length dissertation. Much of it would be of interest and benefit to the serious-minded tape recorder user; much of it would be just so much gibberish to the reader who is not an engineer by training or inclination. Because of this we decided to touch on only the high spots and speak in gen-

eral terms, even at the risk of incurring some displeasure from hi-fi enthusiasts and audio engineers.

The majority of "home" and semi-professional tape recorders have built-in speakers. These speakers are usually *not* adequate for playing tapes for extremely large groups. Also, because of space and price limitations they are usually not what could be considered a "high fidelity" speaker. This is where the external auxiliary speaker enters the picture.

In selecting an auxiliary speaker, here are the factors to be considered:

- 1) Basic type—permanent magnetic or electro-dynamic
- 2) Durability
- 3) Size and weight
- 4) Output wattage
- 5) Price

And, oh, yes—*impedance*.

Type A permanent magnetic speaker is so named because its main component is a real, metal, permanent magnet. A "voice coil" wrapped around part of the magnet is responsible for the unit being able to convert an electrical current into an audible sound. In its simplest form, this is the sum total of a permanent magnet speaker. An electro-dynamic speaker differs from the permanent magnetic speaker in that it does *not* contain a metal magnet. Instead, it utilizes a coil of wire—connected to a steady source of direct current—to perform the function of a metal magnet.

For the average user it will make no difference whether he buys a P-M (permanent magnetic) speaker or an E-D (electro-dynamic). Those who belong to the E-D school point out that any permanent magnet deteriorates in time and therefore the speaker will gradually get weaker. They also mention that if a very loud sound is desired, the permanent magnet can't create a magnetic field strong enough to produce that sound. P-M devotees claim that these factors are not significant in many instances and that other advantages compensate for what deficiencies there are. For most readers of this book the decision of which type of speaker he should buy is the same type he

would make in deciding whether to buy a red Ford or a green Chevrolet; both cars will provide highly satisfactory transportation. It's the same with the speakers—both types will deliver good service.

Durability Again it's a case of "six of one and a half dozen of another." A magnet will lose its magnetism if it is jarred or hit hard enough. However, if you jarred or hit an E-D speaker as hard as you'd have to hit a P-M speaker to damage it, the E-D speaker wouldn't be worth much either. If either of the two have a slight edge over the other, the honors would probably go to the P-M.

Size and Weight Size for size, i.e., a 12-inch P-M compared with a similar 12-inch E-D, the electro-dynamic speaker will be slightly heavier. This becomes a consideration primarily when the speaker will be used as a portable unit, and carried back and forth from the office or studio to various different locations.

When you buy a speaker you don't necessarily get one that is mounted in a baffle or carrying case. For jobs where portability is a consideration, keep looking until you find a case or baffle that is not only convenient to carry but light in weight.

Output Wattage The design and physical size of a speaker is the determining factor in the maximum volume of sound it can handle satisfactorily. Manufacturers list the "maximum watts" for each of their speakers. The ratings range from a fraction of a watt upward, with a 12-watt output being a mighty healthy capacity for an auxiliary speaker. Anytime you need more power than 12 watts you are getting out of the class of speakers and into the class of "horns" and "projectors," which are the "speakers" usually used in baseball parks, fairs, circuses, etc. As an idea of what you could expect to be able to accomplish with a speaker of a given wattage, remember that five watts is enough power to fill an auditorium which has a capacity of from 200 to 400 people.

Price If you plan to buy a speaker on price alone, you'll probably take home a permanent magnetic speaker. In general, with speakers of the same size and wattage the P-M will be slightly cheaper.

A final word: don't forget to check the impedance rating of any auxiliary speaker you plan to buy for use with your recorder. The speaker's *input* impedance must match the recorder's *output* impedance. If it doesn't you've wasted some money, because it just will not work satisfactorily with your recorder—unless one or the other, the speaker or the recorder, is modified.

Splicing Block As mentioned previously, in the section on splicing tape, noise-free splices are not difficult to make if the correct procedure is followed and the person doing the splicing has a minimum amount of manual dexterity. A plastic or metal splicing block, however, simplifies the operation considerably and definitely cuts down the time involved. The block is grooved in such a way that tape alignment and positioning is assured with practically no effort.

Stands Desk or floor microphone stands increase the operational flexibility of any mike and tend to improve the quality of the finished recording. When recording a small group of people it is undesirable for one person to hold the mike and try to "aim" it in the right direction at the right time. If a desk or floor stand is used, the mike can be located in the best all-around position for the group as a whole.

Storage Albums These albums facilitate storage and filing problems. A number of individual boxes of tapes on the same general subject, theme or project, are catalogued and then stored in a group in these albums. The albums fit easily on book shelves or in file cabinets.

Storage Cabinets If available shelf space is limited, many business organizations prefer to buy inexpensive storage cabinets for their storage albums, instead of

storing the albums in a file cabinet. These cabinets are relatively inexpensive and are ideal for organizations which don't have staff personnel available to build special shelves for storing tapes.

Tape Slitter In the preceding section on page 175 we mentioned the miniature size tape, which is only $\frac{1}{8}$ of an inch wide. A tape slitter is a device which will make big ones into little ones— $\frac{1}{8}$ -inch tape into $\frac{1}{16}$ -inch tape.

There are two basic reasons why it may sometimes be desirable to use the small-size tape: 1) to make a "carbon copy" of a single track recording (just make the recording as usual and then slit the tape when you're finished) and, 2) to allow editing of tapes made on a dual track recorder. To edit dual track recordings the tape is slit and then each section is edited in the normal manner. If desired, the tape may be slit *before* the recording.

Telephone Pickup This is a device which fits on a telephone and records both voices during a telephone conversation. Many businessmen always use a device of this kind to record all long distance or overseas telephone calls. This saves trying to take notes while talking and it eliminates any unintentional omissions from reports written after a conversation ends. *Everything* said during the entire conversation will be on tape.

Test Tape Test tapes were mentioned in another chapter. Briefly, as a reminder, their purpose is to help you check your own recorder at home.

Frequently even a "trained ear" can't detect minor troubles developing slowly in a recorder. Such defects won't be noticed until the recording is played back on a unit in perfect condition. Then it's too late to make any improvements—at least on that particular tape.

The test tapes are the best method for the layman to discover troubles with his recorder before they become serious. When played, the test tapes check for wow and flutter, head

alignment, frequency response, signal-to-noise ratio, signal level and tape speed. (See Glossary for definition of terms, or refer to previous chapters.)

Timer and Leader Tape This special tape is spliced right into a recorded tape, or at the beginning or end of an edited tape. When used at the beginning or end of a tape, the timer and leader tape serves the same purpose as the "leader" on motion picture film. When used within a completed tape, its purpose is to separate individual sections of the recording or to provide accurately measured periods of silence.

Track Materializer Being able to *see* the actual sound track on a recorded tape has definite advantages at times. A fluid is available which, when coated on a recorded tape, makes the sound track visible to the eye. This is useful both in editing a tape and in aligning the record and playback heads of the recorder itself.

For information about other available accessories and their uses, it is suggested that the reader consult a local electronic supply house, a camera or appliance store, or other retail outlets handling recorders and tape in volume.

APPENDIX

GLOSSARY OF TECHNICAL TERMS



GLOSSARY OF TECHNICAL TERMS

IN SOME instances, terms listed below are applicable to the general field of radio or television* as well as to tape recording. Definitions and examples are stated here primarily in terms of their relation to tape recording. Some of the words and terms defined in this section are taken from a Minnesota Mining and Manufacturing Company's tape recording glossary.

A-B Switch—Sometimes referred to as an "A-B Fader" this tape recorder control allows the operator to listen to the sounds being recorded *either before* they are actually impressed on the tape *or after* they have reached the recording head and been transmitted to the tape. The value of such a control is that an operator actually in the process of making a recording can check to verify that the sounds "going into" the recorder are actually "coming out" without undue distortion or other undesirable changes resulting from internal malfunctions of the recorder.

Acetate Film—The smooth, transparent plastic film which forms the backing for the majority of magnetic recording tape presently being manufactured.

Alligator Clips—Metal clips with long, spring-controlled mesh-

* For a comprehensive and authoritative treatment of tape recorders as used in radio and television broadcasting, see **AUDIO CONTROL HANDBOOK** by Robert S. Oringel (1956), *Communication Arts Books*, Hastings House, Publishers.

ing "jaws" which look similar to the jaws of an alligator. They are used to make temporary electrical connections: e.g., from the speaker leads to the phono input of a recorder, when making an electronic pickup.

Amplifier—An electronic device used to increase the strength of an electronic signal. An internal amplifier is one contained within the recorder. An external amplifier is housed in a separate case and must be connected to the recorder's circuitry by means of a patch cord.

"A" Wind (sounds like bind)—A tape wound on the reel in such a way that the dull (coated) side is toward the hub of the reel. Most present-day tapes are of the A-wind type. Some recorders are designed to use a "B"-Wind tape, but will easily accommodate an A-wind tape merely by giving the tape a half twist before threading it past the recording head.

Audio Frequencies—Sound waves having a frequency falling within the range which can be heard by the average human ear. Most authorities set this range between 30 and 15,000 cycles per second.

Audio-Visual—The combined, simultaneous use of audible and visible stimuli to teach, instruct, convey information or entertain. A tape recorded narration for color slides or motion pictures would be examples.

"B" Wind—Tape wound with the dull side facing away from the hub of the reel. It can be converted to A-Wind tape merely by giving the tape a half twist as it comes off the reel.

Bias—An alternating current fed into the recording circuit to eliminate distortion of the sound signal which the recording head impresses on the tape. The frequency of this current should be much higher than the maximum frequency the tape will reproduce with ease, otherwise the bias current will result in an audible "noise" being heard from the unrecorded portions of a tape.

Binaural—This is an adjective which implies the simultaneous use of both ears to "hear in perspective." Binaural sound is

analogous to stereographic photographs: there is "depth" and "location" of the sound as well as volume.

Binaural Recorder—A tape recorder which does for the ears what a stereo camera does for the eyes. It makes possible "aural" depth of perception. Such recorders have two separate recording channels or systems. Each system is a complete recording unit within itself, containing its own microphone, amplifier, recording and playback heads and earphones. To make recordings, both systems are used simultaneously with the sounds from the respective systems being impressed on two parallel sound tracks on a single tape. True binaural playback is accomplished by using headphones, with one phone connected to one track and the other phone connected to the second track.

Bulk Eraser—An alternating current device which creates a strong magnetic field that erases an entire reel of magnetic tape almost instantaneously. A bulk eraser eliminates the necessity of running a tape through the recorder, with the volume control at zero and the "record" switch on, to erase the tape completely.

Clock Timer—A device, similar to a "clock radio," which can be used to turn an unattended recorder on and off at a specific, predetermined time.

Capstan—The shaft which rotates as it presses against the tape, pulling it past the recording and playback head at a constant speed.

Cycles Per Second—Abbreviated "cps." A unit for measuring the frequency of alternating current. If the frequency is between 30 and 15,000 cps the average human ear will hear "sound."

Continuous Playbacks—Devices which will repeat-play the same tape or portion of tape over and over again. These devices are turned on and off by such means as electric eyes, automatic timers, switches, etc.

Decibel—Abbreviated "db." An arbitrary unit of measure, which applies to sound in the same way that a degree Fahrenheit is a measure of relative heat intensity. A change

in sound intensity (volume) of one db is the smallest change a human ear can detect.

Distortion—Any difference between the original sound and the reproduced sound. No present-day recorders are completely free of internally generated distortion, but the design of higher-quality machines minimizes distortion below the point of significance. Regardless of the quality of a recorder, however, it cannot compensate for defects in other elements which make up the complete system—microphone, external amplifier and external speaker.

Dual Track Recorder—Also called a “half-track” recorder, this is a machine with a recording head which magnetizes only one-half the total width of the tape, at one time. After one “side” of the tape is completely recorded the reel can then be turned over and recorded from beginning to end again—on the second “track.” Obviously, a dual track recorder provides twice the recording and playing time than will a single track recorder on the same size tape.

Dubbing—Sometimes called “dub” or “dupe.” This is the process of copying a given recording by playing the tape on one machine while using a second machine to record the output of the first machine.

Dynamic Range—The difference between the softest and the loudest sounds a tape recorder can reproduce within predetermined limits of acceptable distortion. The dynamic range is usually measured in db’s and expressed as a ratio.

Earphones—These are also called headphones. They correspond to miniature speakers, designed so that they fit comfortably on, in or near the wearer’s ears. There are many different types insofar as “style” is concerned, ranging from the “ear-muff” type to the stethoscope variety. (See page 181.)

Editing—Selecting certain portions of a tape recording, or of a number of different tape recordings, then splicing them together in some organized sequence.

Electromagnetism—Magnetism created by means of electrical phenomena. A coil of wire is wound around a core of metal—usually iron—and electrical current is sent through the wire.

As current passes through the wire, a magnetic "field" is produced. The field varies in intensity (strength) according to variations in the current.

Electronic Pickup—Usually used with reference to sound coming off a disc or another tape. Instead of recording the audible sound as it comes out of a speaker, the electrical impulses (which make up the "sound") are fed directly into the input system of the instrument on which the original sound is being rerecorded. All things being equal this method of recording results in better fidelity of the final recording, because of the elimination of one source of a "transfer loss." There would be a transfer loss as the speaker converted the electrical sound impulses to audible sound and then further loss as a microphone converted the sound *back* to electrical power which would then become the "original" input to the instrument producing the "final" recording. One example of an electronic pickup would be connecting one end of a patch cord to the speaker leads of a radio or phonograph speaker, and the other end to the recorder input.

Erase—To "remove" the sounds from a recorded tape. This is done by means of magnetism, either by an "erase head" built into the recorder, or by a bulk eraser which is an accessory device completely separate from a recorder. In all portable recorders the erase head is physically positioned so that the tape contacts it before contacting the recording head. In most instances the erase head is automatically operative only when the "Record-Playback" control is in the "Record" position. For maximum fidelity on any given recorder it is advisable to erase a previously recorded tape before another recording is made on the same tape. Without a bulk eraser this can be done on the recorder itself merely by setting the volume control at zero, and running the tape through the machine with the "Record-Playback" switch in the "Record" position.

Eraseure—The neutralization of a magnetic pattern on a recorded tape. This is accomplished by exposing the tape to a strong magnetic field which erases (neutralizes) whatever magnetic pattern was already on the tape. An "erase" head

on a tape recorder does this automatically to any sound previously recorded on the tape, just before the tape reaches the "record" head.

Erase Head—The electromagnet the tape passes first as it unwinds from the feed to the take-up reel.

Equalization—Intentional electronic modification of the frequencies which make up the original sound fed into the input of a recording system. The same process can be applied to recorded sounds coming off a tape on playback. This is one example of equalization: during recording, the high frequencies of a given sound are electronically "exaggerated" before they are impressed on the tape; during playback, they are electronically "subdued." In practice, equalization can be applied to the low, middle or high tones of a recording, either during recording or playback or both. Normally a compensation of this type is automatic because of the design of the circuitry in a recorder. This serves to correct deficiencies in the recording system itself and increase the signal-to-noise ratio of the recorder.

Extension Cords—Auxiliary, insulated electrical cords used either to carry 110-volt power to a remote recorder or to increase the distance any given microphone may be moved about and still remain "plugged in."

Fader (See "A-B" Switch)—Also a multiple-unit volume control used for the purpose of allowing a gradual changeover, from one microphone or other sound input to another, without an abrupt or noticeable cessation of sound.

Feedback—An electrical "sound circle." Technically it is a transfer of electrical energy from any given point in a sound system back to a preceding point in the same system. An example would be: sound going into a microphone, working its way to the speaker, coming out of the speaker and then going back into the microphone. Feedback is generally highly undesirable. It announces its presence by making a loud, high squeal come out of a speaker.

Fidelity—The degree of absolute and total uniformity and conformity with which the reproduced sound matches the original sound fed into a recording system.

Flat Response—The reproduction of all tones—low or high—in their proper proportion with respect to original volume, relative intensity, etc. A sound system capable of doing this is said to have a “flat response.” When data is cited relative to the response capabilities of a given recorder, it is usually given in a manner such as this: “. . . essentially flat response, plus or minus one db, from 40 to 12,500 cycles per second.”

Flutter—An unsteadiness of recorded sound volume and pitch, not present in the original sound. It is usually noticeable in the higher frequency ranges. This is a form of distortion. The variations result from short, rapid—and possibly minute—changes in the speed at which the tape moves past the recording or playback head.

Foot Switch—An external switch on a recorder, operated by foot pressure, which can be used to start and stop the recorder.

Frequency—The number of times per second a wave of electrical energy (such as a sound wave) completes a cycle. One example of a typical cycle would be: a wave starting at a zero reference point, rising to its maximum amplitude (height), returning to zero, falling to its maximum *negative* height (depth) in the opposite direction, and returning to the zero point. The number of times a given wave does this in a given second is the frequency of that wave.

Frequency Range—The over-all range between the highest and lowest frequencies a recorder is capable of reproducing with fidelity at a usable or acceptable volume.

Frequency Response—A rating, usually in the form of a curve plotted on a graph, which illustrates how well a recorder handles the various frequencies constituting an original input to the recorder's circuitry.

Gain—The ratio between the level of an input and the level of the corresponding output of the sound system. It is usually expressed in db's. The gain of a given recorder is primarily a function of its internal amplifier. Gain can be increased by means of an external amplifier, used in conjunction with the recorder.

Gap—Also called “slit.” The minute distance between the magnetic poles of the erase, recording and playback heads. The width of the gap in a playback (reproducing) head is a critical factor in the recorder’s frequency response, because it controls the high frequency response. The recording head is not quite so critical in the same respect. However, making a recording with the volume control set too high causes distortion by increasing the *effective* width of the recording head gap, thereby impairing frequency response. Gap is measured in mils. Present-day portable recorders may have head gaps ranging from 1 mil down to $\frac{1}{4}$ mil.

Head—The electromagnet across which the tape is drawn. The record head magnetizes the tape in a pattern which matches the sounds of the original input. The playback (reproducing) head reacts to the magnetic pattern in such a way that recorded sounds are reproduced. Most portable recorders use a combination record-playback head, with the function of the head at any given instant being determined by a switch which introduces the necessary changes into the circuitry controlling the head. The erase head removes any magnetic pattern on a recorded tape. The record head puts a pattern on the tape. The playback head “reads” whatever magnetic sound pattern may be on the tape.

Head Demagnetizer—A small electromagnet, usually operating off 110-volt alternating current, which removes magnetism which has accumulated within the head itself. The demagnetizer does its job in much the same way as an erase head removes the magnetic pattern which represents sound on a recorded tape.

High Fidelity—A term generally applied to the entire system (or sometimes the respective components) of an audio recording or playback system. It implies the ability of a system to reproduce a given range of audio frequencies with an absolute minimum of distortion. It has become common practice to classify an audio system of any type as “high fidelity” when it is capable of faithfully reproducing frequencies ranging from 20 to 20,000 cycles per second.

Impedance—A form of opposition to the flow of a varying elec-

trical current. When an electrical phenomenon called "reactance" is present, *along with* resistance, the result is "impedance." Both impedance and resistance are measured in ohms. The important fact to remember is that impedance implies the presence of alternating (or any other varying current) *and*, that the frequency of alternations or variations affects the amount of impedance which will exist in a given circuit at a given time.

Impedance Match—The condition where there is equality of the respective output and input impedances of interconnecting components of a sound system—as for instance between a microphone and an external amplifier or between an external amplifier and a recorder's input circuit.

Inches Per Second—Abbreviated "ips." The speed at which tape travels from the feed reel to the take-up reel when the tape control switch is in the "record" or "playback" position.

Index Counter—An indicator which uses numbers to register the length of tape which moves past it, thereby providing a positive means of identifying or finding a specific section of a fully or partially recorded tape.

Input—The electrical energy fed into an amplifier.

Inverter—An electrical or electronic device used to convert direct current into alternating current. An example of its use would be to take an automobile battery's output current and convert it to the type and voltage needed to operate a standard portable tape recorder.

Jack—An electrical terminal into which a plug is inserted for the purpose of making temporary electrical connections between two units or two different circuits.

Labeling Tape—Pressure-sensitive, non-magnetic tape which can be written on with pencil, pen, ball point pen or typewriter, for the purpose of labeling or otherwise identifying reels of magnetic tape.

Level—The degree of electronic amplification or reduction to which an electrical input is subjected as a result of how far "up" or "down" a recorder's volume control is set when a recording is being made. Technically, "level" is the mean amplitude of a variable sound or radio wave. In different

terms, "level" is simply the intermediate point between sound wave amplitude extremes on either side of an arbitrary reference point. In recording this refers primarily to extremes in volume of original sound. The ideal "level" at which to make a recording is the point at which the loudest sounds are *not* overamplified to the point where distortion results: neither are they *under*amplified so that they cannot be played back at desired volume without turning the volume control up so high that distortion is generated within the recorder itself. (See also "Recording Level.")

Level Indicator—A device which indicates the level at which a recording is being made. It provides a warning against "over-recording" (overamplification and consequent distortion of the incoming signal) or under-recording. The indicator may be one of several types: neon bulb; "magic eye"; or, "VU" (volume unit) meter.

Line—A cord, cable or other conductor used to transmit electrical power or electronic signals.

Line Cord—A two-wire cord which terminates in a two-prong plug. In general use it refers to the electrical conductor which connects electrical or electronic equipment to the source of 110 volt power.

Magnetic Tape—A plastic or paper tape which has been coated with a layer of magnetizable iron oxide particles.

Microphone—A device which converts and transfers one type of power to another type—acoustic power to electrical power. Technically this consists of converting sound waves into corresponding audio frequency electrical energy. Regardless of type, all microphones operate on the same basic principle: some sort of flexible diaphragm moves in accordance with sound wave variations: this movement results in a minute voltage which is then fed to an amplifier which "boosts" the electrical energy to the point where it is useable within the remaining circuits of the sound system. (See pages 166-169.)

Mixer—A device designed to combine a number of separate electrical inputs into a consolidated electrical output. Mixers are basically of two types—mechanical and electronic.

Mechanical mixers are considerably less expensive than the cheapest electronic mixers. Likewise, they are less flexible in their capabilities. For example, under normal circumstances it is not possible to use a mechanical mixer to combine the respective inputs from a crystal microphone and a dynamic microphone. Such a combination of inputs would be possible with most electronic mixers.

Monitor—To listen by means of earphones or a special speaker to what is being recorded at the time a recording is in progress.

Motor Board—That part of a tape recorder on which are mounted those parts other than the strictly electronic components, such as amplifiers, loudspeakers, etc. This is also sometimes called the "tape transport mechanism." On the motor board are mounted: the motor or motors, reels, heads and controls.

Output—The electrical energy coming out of an amplifier. A recorder's output is normally fed into a loudspeaker, either directly, or after having been sent through an external amplifier unit for additional amplification.

Oxide—Microscopically small particles of ferric oxide dispersed in a liquid binder and coated on a tape backing. These oxides are magnetically "hard"—meaning that once magnetized, they remain in that state permanently unless demagnetized by subsequent exposure to a strong magnetic field.

Patch Cord—A short cord with a plug at both ends or a plug on one end and alligator clips on the other. Patch cords are used to convey electronic signals from one circuit— or physical unit—to another. They are not used for 110-volt current.

Playback Head—The electromagnet which "reads" the sound impulses magnetized on the tape being drawn past it. In most medium and low-priced portable recorders the playback head is physically combined with the recording head. The functional interchange between its operation as a playback head and its operation as a recording head is accomplished by a change in the circuitry controlling the head at a given instant. The change in circuitry is usually accom-

plished by means of a mechanical switch. Professional and semi-professional recorders usually contain a separate playback head and a separate recording head, in addition to a separate erase head. In all cases the erase head will be separate from the recording-playback head.

Plug—A connecting device used for making instantly removable connections to a corresponding jack or similar outlet.

Polyester Film—Plastic film backing for magnetic tape. The magnetizable oxide is coated on polyester film instead of on acetate. Polyester tape is considered to have excellent strength characteristics and high resistance to humidity changes.

Power Amplifier—An electronic device which boosts the incoming electrical input to the point where it will operate a loudspeaker.

Power Cord—Sometimes called "line cord." The two-wire cord which is used to connect the tape recorder to the source of 110-volt A.C. current.

Pre-amplifier—An amplifier designed to boost extremely weak electrical inputs to the point where they are useable by the power amplifier. Normally the output from a microphone, magnetic playback head or a phonograph pickup, would be fed first to a pre-amplifier before being fed into the power amplifier which drives the speaker. Some tape recorders use a circuit design which combines the pre-amp and the power amplifier. Others, usually the more expensive models, utilize a separate pre-amplifier. When a separate pre-amplifier is used it will usually contain an equalization circuit. The equalization circuit minimizes the electronic distortion which would otherwise result as a consequence of the original input being "worked on" by an additional, individual electronic component.

Pressure Pads—Spring-mounted felt pads which hold the magnetic tape in close contact with the heads on some recorders.

Pressure Roller—Also called "capstan idler" or "puck." A rubber, spring-pressure roller which holds the magnetic tape tightly against the capstan to insure constant tape speed and prevent slippage.

Printing—Also called “print-through,” or “magnetic printing.”

The transfer of recorded sounds from one layer to another layer of tape wound on a reel. It occurs most frequently when strongly magnetized portions of a tape happen to be wound over or under unmagnetized or weakly magnetized portions. Printing is not a serious problem today. The availability of high-quality tapes minimizes the possibility of printing, even if no special precautions are taken to avoid it. The recordist can take additional precautions however: avoid recording at an excessively high level; store recorded tapes in temperatures below 75 degrees F.; store important tapes in a steel can.

Raw Tape—Magnetic tape which has not been recorded.

Recorded Tape—Also called “pre-recorded tape.” A recording, on tape, available from a commercial source. The term also applies to any tape that has been recorded.

Recording Head—The electromagnet which impresses a magnetic pattern on the tape which is drawn past it. The magnetic pattern corresponds to the sounds which comprise the original input to the recording system. The recording head is frequently physically combined with the playback head. (See also, “Playback Head.”)

Recording Level—Generally speaking this term refers to the positioning of the volume control when a recording is being made. When starting to make a recording, a good rule of thumb is to position the volume control midway between its maximum and minimum position and then test the quality of the playback at various settings of the volume control. Technically speaking, “recording level” is the degree of electronic amplification or reduction to which an electrical input is subjected within the recorder’s circuitry. Too much amplification will result in distortion of the sound *being* recorded. Too little amplification will result in the distortion of the sounds coming out of the speaker—even though they may not be distorted on the tape itself. It is for this reason that the mid-point volume setting is recommended when making a recording: maximum opportunity then exists for *either* an increase or a decrease in *playback* volume. (See also, “Level.”)

Recording Noise—Noise generated electronically or otherwise by the components of the recorder (or over-all sound system) itself. A poorly erased tape can also be the source of recording noise. The noise takes many forms: it may be either a hiss, hum or slight “popping.”

Reel Adapter—A device which fits on a recorder in such a manner that reels of larger size than “normal” can be used on that machine. An example would be: a set of adapters which allow a 10-inch reel to be used on a recorder designed to accommodate a maximum-size reel of seven inches in diameter.

Remote Control—A device which allows the recorder to be operated by means other than the self-contained knobs, dials and switches. An example would be a foot pedal which controls the starting and stopping of the tape transport mechanism.

Self-powered Recorder—A tape recorder which contains a built-in power supply. The power supply might be either a combination of wet and dry batteries or dry batteries used in conjunction with a spring-driven motor.

Selector—A mechanical, electronic or electrical device used to make connections to any one of a number of electrical circuits.

Signal-to-Noise Ratio—The difference between the loudest, undistorted tone recorded and reproduced and the noise generated within and by the various components which make up the complete recording network or system.

Single Track Recorder—Also called a “full track” recorder. A recorder with a recording head which magnetizes the full width of $\frac{1}{4}$ -inch tape. There are a few machines which magnetize only a portion of the full width—that portion being a track which extends slightly above and slightly below an imaginary line running lengthwise down the middle of the tape.

Slit—Also called “gap.” The minute distance between the magnetic poles of the erase, recording and playback heads. (See, “Gap.”)

Sound—The vibration of some element, physical or otherwise, at a rate which can be heard by human ears. Anything which possesses the ability to vibrate will “carry” sound. The resulting travelling vibrations are called sound waves.

Splicing Block—A plastic or metal device designed to facilitate rapid and simple tape alignment and positioning so that tape can be spliced with minimum effort and maximum precision. In addition to conventional splicing blocks, which necessitate the use of splicing tape, there are also thermal splicers, which make splices by means of heat and pressure.

Splicing Tape—A pressure-sensitive, non-magnetic tape used for splicing magnetic tape. It has a “hard” adhesive which will not ooze, thereby eliminating the possibility of “gumming up” the recording head or causing adjacent layers of wound tape to stick together. Cellophane tape should *never* be used to make splices.

Tape Guides—Grooved pins of non-magnetic material mounted at either side of the recording head assembly. Their function is to position the magnetic tape on the head as it is being recorded or played.

Tape Loop—A piece of magnetic tape with the ends spliced together to form an endless loop. Using a loop it is possible to play back a recorded message repetitively without rewinding the tape.

Tape Slitter—A device which slices one roll of $\frac{1}{4}$ -inch magnetic tape into two rolls of $\frac{1}{8}$ -inch tape. The design of some recorders permits the installation of the slitter right on the machine itself and the slitting is accomplished merely by running a reel of tape from the feed reel to the take-up reel.

Tape Speed—Speed at which tape moves past the recording or playback head when the control switch is in the “record” or “playback” position. Standard speeds for portable recorders are $3\frac{3}{4}$ inches per second (abbreviated ips) and $7\frac{1}{2}$ ips. Professional and semi-professional recorders usually operate at 15 ips and even 30 ips. Most newer portable recorders are “dual speed”—which means they can operate at one of two different speeds, depending on the positioning of a selector

switch, lever or knob. Slow tape speeds are acceptable when tape economy is of paramount importance or where fidelity of sound is of no consequence. There are recorders available which operate at speeds as low as $1\frac{5}{16}$ ips. As a general rule, the faster the tape speed, the better is the fidelity of the finished recording. Tape recorded at $3\frac{3}{4}$ ips will be raised one octave in pitch when played back at $7\frac{1}{2}$ ips. Cutting speed in half lowers tone by one octave.

Telephone Pickup—A device which is used in combination with a telephone receiver to pick up both voices during a conversation so that they may be recorded on tape.

Test Tape—A pre-recorded tape containing sounds and signals which will test a recorder for such items as wow and flutter, head alignment, frequency response, signal-to-noise ratio, signal level and tape speed. These tapes are recorded under rigidly controlled conditions and provide the owner of a recorder with a simplified method of detecting “troubles” before they assume major proportions.

Threading Slot—Slot in recording head assembly cover plate into which the tape is slipped when threading the reels for use of the recorder.

Timer and Leader Tape—Strong, non-magnetic tape which can be spliced to either end of a tape to prevent damage or breaking off of the magnetic tape ends. It serves the same purpose as “leader” on motion picture film. It can also be used “within” a complete recording to separate various segments or individual sections or to provide accurately measured periods of silence.

Tone Control—The knob which varies the bass or treble tones which the recorder’s amplifier allows to reach the speaker in varying degrees of intensity.

Track Materializer—A fluid which, when applied to a recorded tape, makes the sound track visible to the eye. This is useful both in editing and in aligning the record and playback heads of the recorder itself.

VU Meter—An instrument calibrated to indicate the power level of an audio frequency in “volume units.” Volume units

are an arbitrary unit of measurement, analogous to a Fahrenheit "degree."

WOW—A slow unsteadiness of sound volume and pitch, similar to the sounds that would be heard when a record rotates at varying speeds on a turntable. This is a form of distortion and it results primarily from slow variations in the speed of the tape as it travels past the record or playback head.

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Much of Mr. Hodgson's journalistic experience was obtained during seven years of active duty in the Marine Corps, of which he is now a Major in the reserves. In 1950-52, he served as head of the Marine Corps Radio and Television Section where he was producer and announcer of several weekly network shows, and also handled production of Marine Corps recruiting advertising materials.

Mr. Hodgson joined Advertising Publications, Inc. in Chicago in 1952 to take on the job of planning a new publication—*Advertising Requirements*, serving as managing editor until July 1955 when he was appointed to his present post of executive editor of both *Advertising Requirements* and *Industrial Marketing*. He is also instructor in business publication editing and layout at the University of Chicago and lectures at Northwestern University.

H. JAY BULLEN, a native of Chicago, also has a long journalistic and public relations background. A graduate of Occidental College, he has been public relations director of the Pasadena Playhouse, general manager of the Marines' *Leatherneck* Magazine and, on release from active service, managing director of the VendFilm Division of Automatic Merchandising Company, Chicago. A Captain in the Marine Corps Reserve, Mr. Bullen is now managing director of BulMarc Features in San Clemente, Cal.